No.

JAPAN INTERNATIONAL COOPERATION AGENCY

MINISTRY OF SETTLEMENT & REGIONAL INFRASTRUCTURE
REPUBLIC OF INDONESIA

THE STUDY
ON
RURAL WATER SUPPLY PROJECT
IN
NUSA TENGGARA BARAT AND NUSA TENGGARA TIMUR

FINAL REPORT
VOLUME V
SUPPORTING REPORT 3

CONSTRUCTION PLAN AND COST ESTIMATES

Appendix 11 CONSTRUCTION PLAN
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VOLUME VI SUPPORTING REPORT 4

ORGANIZATION AND MANAGEMENT

OUTLINE OF THE STUDY – Bahasa Indonesia
GARIS BESAR STUDI & SEMINAR UNTUK ALIH TEKNOLOGI

ABBREVIATIONS

ADB	Asian Development Bank
APBD I	Anggaran Pendapatan dan Belanja Daerah Tingkat I (Provincial Budget)
APBD II	Anggaran Pendapatan dan Belanja Daerah Tingkat II (District Budget)
APBN	Anggaran Pendapatan dan Belanja National (National Budget)
ARI	Acute Respiratory Infections
AusAID	Australian Agency for International Development
BAPPEDA	Badan Perencanaan Pembangunan Daerah Tingkat-I and Tingkat-II (Development Planning Board for Provincial and District Level)
BAPPENAS	Badan Perencanaan Pembangunan Nasional (National Development Planning Board)
BDD	Bidan di Desa (Village midwife)
BHN	Basic Human Needs
BMG	Biro Meteorologi dan Geofisika (Meteorology and Geophysic Agency)
BPAM	Badan Pengelola Air Minum (Management Board for new Drinking Water Projects before being established as a PDAM)
BPD	Village Representative Council
BPL	Below Poverty Line
BPS	Biro Pusat Statistik (Central Bureau of Statistics)
BPT	Break Pressure Tank
Broncaptering	Any small structure built to 'capture' a water source
Buis beton	Traditional concrete rings used to line hand-dug wells
Bupati	Kepala Kabupaten (Head of a District; sometimes called "Regent")
Camat	Kepala Kecamatan (Head of a Sub-District)
CARE	Co-operative for Assistance and Relief Everywhere (International NGO)
CCF	Christian Children's Fund
CIDA	Canadian International Development Agency
Cipta Karya	Direktorat Jenderal Cipta Karya (Directorate General of Human Settlements DGHS)now restructured and integrated into Ministry of Settlement and Regional Infrastructure
CMR	Child Mortality Rate
DATI I	Daerah Tingkat I (Provincial Government Level)
DATI II	Daerah Tingkat II (District Government Level)
Desa	Rural village, lowest level of local Government
DG	Directorate General
Dinas	Provincial or District level governmental department
DIP	Daftar Isian Proyek (List of Development Projects)
DPU	Generic term for all departments of Public Works now included in Kimpraswil.
Dukun	Traditional birth attendant
DUPDA	Daftar Usulan Proyek Daerah (List of Proposed Yearly Development Projects at Tk.II.)
Dusun	Sub-Village/Hamlet in rural area
EC	Electric Conductivity
EIIKK	Eastern Islands IKK Water Supply and Sanitation Project (Aus AID program)

ESWS	NTB Environmental Sanitation and Water Supply Project (Aus AID program)
FGD	Focus Group Discussions
FIRR	Financial Internal Rate of Return
FLOWS	Flores Water Supply and Sanitation Reconstruction and Rural Development Project (AusAID program)
FRP	Fiber Reinforced Plastics
GIP	Galvanized Iron Pipe
GL	Ground Level
GOI	Government of Indonesia
GOJ	Government of Japan
GRDP	Gross Regional Domestic Product
GSP	Galvanized Steel Pipe
GTZ	German Technical Cooperation Agency
Hamlet	A small rural community not recognized as a Dusun
HC	House Connection (To a piped water supply system, usually metered)
HDPE	High Density Polyethylene Pipe
IBRD	International Bank for Reconstruction and Development (World Bank)
IEC	Information, Education and Communication
IGA	Income Generation Activities
IKK	Ibu Kota Kecamatan (Core Area of a Sub-District)
IMR	Infant Mortality Rate
Ir.	Insinyur (The Professional title 'Engineer')
JBIC	Japan Bank For International Cooperation
JICA	Japan International Cooperation Agency
K. Desa	Kepala Desa (Head of a Village - Lowest official level of local Government)
Kabupaten/Kab	District/Regency (Local Government level II or Tk.II)
Kampung	General term for any sub-village or hamlet, but more commonly used in urban and rural areas
Kecamatan	Sub-District
Kelompok	An unofficial committee or group of people
Kelurahan	Urban village, the lowest administrative unit in status equal to a Desa
Kepala Desa	Head of a Village (Lowest official level of local Government)
Kepala Dusun	Head of a Hamlet
Kepala Suka	Traditional Religions Leader (In Sumba)
Keputusan	Decree
KFW	German Development Bank
KHPPIA	Kelangsungan Hidup Perkembangan Perlindungan Ibu dan Anak (Development and Protection for Mother and Child)
Kimpraswil	Permukiman dan Prasarana Wilayah (Ministry of Settlement and Regional Infrastructure)
KK or K/K	Kepala Keluarga (Head of a family)
KLP	Koperasi Listrik Pedesaan
Kotamadya	City - equivalent administrative status to a Kabupaten
LBW	Low Birth Weight
LKMD	Lembaga Ketahanan Masyarakat Desa (Village self reliance organization, village development council)

LRWSS	Lombok Rural Water Supply and Sanitation Project (AusAID program)
Lb.	Labuhan (Common place name) Coastal plain behind the seashore
M.A.	Mata Air (Spring)
MOH	Ministry of Health
MOHA	Ministry of Home Affairs (Dalam Negeri)
MOU	Memorandum of Understanding
MSRI	Ministry of Settlement and Regional Infrastructure
Musbangdes	Musyawarah Pembangunan Desa (Village development planning discussion)
NGO	Non-governmental Organization
NTB	Nusa Tenggara Barat (West Nusa Tenggara)
NTT	Nusa Tenggara Timur (East Nusa Tenggara)
O&M	Operasi dan Pemeliharaan (Operation and Maintenance)
O/H	Overhead (High tension electric power line)
OECF	The former Overseas Economic Cooperation Fund of Japan (now JBIC)
P2AT	Proyek Pengembangan Air Tanah (Groundwater Development Project)
P3P	Proyek Peningkatan Prasarana Pemukiman (formerly P3AB) (Development and Management of Water Supply Construction Projects)
PAM	Perusahaan Air Minum (Water Enterprises) Generic term used for PDAM and BPAMs
PDAM	Perusahaan Daerah Air Minum (Regional Drinking Water Enterprise)
PEMDA	Pemerintah Daerah. Local government at any level, usually MOHA
PERPAMSI	Persatuan Perusahaan Air Minum Seluruh Indonesia (Indonesian Water Supply Association)
Peraturan	Regulation
PH	Public Hydrant
PKK	Pembinaan Kesejahteraan Keluarga (Local Women's Welfare Organization)
PLN	Perusahaan Listrik Negara (National Electricity Enterprise)
PMD	Department of Community Empowerment
POKMAIR	Kelompok Pemakai Air (WUG)
Polindes	Poliklinik Desa (Village health sub-clinic)
Propinsi	Province (First level of local government Tk.I.)
Puskesmas	Pusat Kesehatan Masyarakat (Village Health Center)
PVC	Unplasticized Polyvinyl Chloride (Pipe)
PVP	Photovoltaic System
Rakorbang	Rapat Koordinasi Pembangunan (Project/Budget selection discussion at Tk.II) (Coordination Meeting for Development Budget Planning)
RC	RC (Reinforced Concrete)
RDWS	GOI Rural Water Supply Development Program
RESV	Reservoir
RK	Rukun Kampung (Hamlet in a rural area)
RRA	Rapid Rural Appraisal
RT/RW	Rukun Tetangga (Neighborhood)/Rukun Warga (Hamlet in an urban area)
RWSS	Rural Water Supply and Sanitation Project (ADB program)
Sawah	An area of irrigated land used for growing paddy
SC	Specific Capacity
Sekretaris	Secretary, as in Sekretaris Desa

SISKES	GOI Health Services Improvement Program
SSF	Slow Sand Filter (Water Treatment Plant))
SWL	Static Water Level
T	Temperature
TB	Tuberculosis
TBA	Traditional Birth Attendant
TNI	Tentara Nasional Indonesia. The Indonesian armed force
TP-PKK	Women's Movement Organization
Tk.I	Tingkat I. The first level of local government. I.e. Province
Tk.II	Tingkat II. The second level of local government. I.e. District
U5MR	Under 5 Mortality Rate
UDKP	Usulan Kecamatan (List of Development Planning Proposals)
UFW	Unaccounted-for-Water
UNDP	United Nations Development Program
UNICEF	United Nation Children's Fund
UU	Undang Undang (Law)
VAP	Village Action Plan
VES	Vertical Electric Sounding
WSS	Water Supply and Sanitation
WSSLIC	Water Supply and Sanitation Project for Low Income Communities (World Bank program)
WTP	Water Treatment Plant
WUA	Water Users' Association
WUG	Water Users' Group

UNITS

Length

mm	=	millimeter
cm	=	centimeter
m	=	meter
km	=	kilometer

Area

cm^2	=	square centimeter
m^2	=	square meter
km^2	=	square kilometer
Ha/ha	=	hectare

Volume

cm^3	=	cubic centimeter
m^3	=	cubic meter
L	=	liter
MCM	=	million cubic meter

Weight

mg	=	milligram
g	=	gram
kg	=	kilogram

Time as denominator

/sec.	=	per second
/min.	=	per minute
/hr.	=	per hour
/day	=	per day
/month	=	per month
/yr.	=	per year

Electric Measurement

V	=	Volt
A	=	Ampere
Hz	=	Hertz
W	=	Watt
kW	=	Kilowatt
MW	=	Megawatt

Others

%	=	percent
HP	=	horsepower
°C	=	Celsius degree

Derived Measures

L/c/day	=	liter per capita per day
kWh	=	kilowatt-hour
MWh	=	megawatt-hour
kVA	=	kilovolt ampere
mg/L	=	milligram per liter
μg/L	=	microgram per liter
meq/L	=	milliequivalent per liter
mS/m	=	millisiemens per meter

Abbreviation

m.bgl	=	meter below ground level
m.agl	=	meter above ground level
m.asl	=	meter above mean sea level
m.bsl	=	meter below mean sea level

Appendix 11

CONSTRUCTION PLAN

Appendix 11
CONSTRUCTION PLAN

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11.1 Introduction

11.1.1 Background

The Government of Indonesia (GOI) has endeavored to develop the east Indonesia region. Despite the efforts of the GOI, people in the region still face difficulties in obtaining clean and safe water. They are under severe pressure to use unsafe and unstable water from dug wells, surface water and rainwater. Water carrying for long distances is a common practice, particularly in the dry season. The installation of sustainable water supply systems is urgently required.

Under the above circumstances, the GOI requested the Government of Japan (GOJ) to provide technical and financial assistance for a Rural Water Supply Project in the Provinces of Nusa Tenggara Barat (NTB) and Nusa Tenggara Timur (NTT).

11.1.2 Outline of the Report

This appendix proposes a plan to construct facilities designed for the Rural Water Supply Project in the Provinces of Nusa Tenggara Barat (NTB) and Nusa Tenggara Timur (NTT), such as intake facilities for spring, tube and shallow wells, transmission pipelines, treatment facilities and distribution facilities for seventeen villages. It aims to present a basis for cost estimate for the study.

11.2 Project Implementation

11.2.1 Phased Development

The seventeen villages to be developed are spread across six islands in NTB and NTT Provinces stretching about 1,000 km from Mataram in the west to Kupang in the east, as shown in Figure A11-2.1. The islands of Lombok and Sumbawa are in NTB Province and the other four, Flores, Sumba, Rote and Timor are in NTT. It is proposed that the proposed villages would be developed in two phases because of the scale of the project.

There are two implementation plans conceivable for phased development of this project. One is phased development by province (Plan 1), the other simultaneous development in both provinces (Plan 2).

The merit and demerit of Plan 1 and Plan 2 are tabulated to compare below.

Comparison between Plan 1 and Plan 2

Comparison item	Plan 1	Plan 2
1. Number of phasing	2 phases	2 phases
2. Executing agency*1	• Each of the provincial offices may be an executing agency on site.	• Central government is to liaise with both provincial offices to coordinate them on site.
3. Policy*2	• Implementation program meets well with the policy of the central government.	• Implementation program does not meet with the policy of the central government very well.
4. Management*3	• Management is easier than that for Plan 2.	• Management is more difficult than that for Plan 1.
5. Time*4	• Work period may be shorter than that of Plan 2.	• Work period may be longer than that of Plan 1.
6. Cost*5	• Cost is less than Plan 2.	• Cost is more than Plan 1.
7. Quality*6	• Quality of works and services will be high.	• Quality of works and services may not be high.
8. Risk*7	• It is safer than Plan 2.	• It is more risky than Plan 1.
9. Budget arrangement*8	• Donor may be willing to finance and it is easy to arrange the budget.	• Donor may not be always willing to finance and it is difficult to arrange the budget.
10. Equality*9	• It will not bring equal opportunity of development to the two provinces.	• It will bring equal opportunity of development to the two provinces.

Note: Plan 1: Phased development by province in 2 phases
Plan 2: Simultaneous development in both provinces in 2 phases
*1: Executing agency is the agency that is to conduct project management on site.
*2: Accordance with the present policy of the government of Indonesia, i.e. decentralization.
*3: Ease of project management. The smaller the number of local government and agencies to liaise with, the easier it will be to manage the project.
*4: Period required to execute the project
*5: Project cost, especially construction cost and consultancy services cost
*6: Expected quality of works and services to be performed
*7: Risk of implementation of the project, such as coincidence of investment by plural donors and delay or discontinuation of the project due to lack of coordination between two provinces. The lower the risk, the safer it is the donor to invest.
*8: Ease of budget arrangement, or donors' willingness to finance
*9: Equality between the two provinces in having the opportunity to develop the rural area

11.2.2 Implementation Agency

After an Inter-Governmental Agreement (E/N) for the implementation of a rural water supply project between the donor and the Ministry of Foreign Affairs, Indonesia, the Ministry of Settlement and Regional Infrastructure will be the execution agency for the project.

The Directorate General of Urban and Rural Affairs in the Ministry of Settlement and Regional Infrastructure has overall responsibility for rural water supply development in Indonesia. The DG has three regional Directorates; the eastern, central and western Directorates. NTB and NTT Provinces come under the Directorate of Urban and Rural Affairs, Eastern Region. The Directorate General will be responsible for the negotiation and signature of any procurement contract, such as employment of consultant and civil works, under the project. Also he should issue the certificates to settle the payment to the consultant and contractors in accordance with the contracts.

The operative GOI agencies at Provincial and District level are BAPPEDA Tk. I and Tk. II respectively, for matters of policy and liaison with other branches of PEMDA, but they are not engineers. Kimpraswil Tk. I and Tk. II, as the successors to the disbanded Ministry of Public Works, are responsible for the management of most engineering works carried out in their areas, but they are not normally involved in aid projects funded by foreign governments and donor agencies. Co-operation with Kimpraswil would involve liaison with eleven different offices at two separate levels of government (5 for NTB and 4 for NTT). P3P, which exists only at Provincial level, is responsible for the construction of water supply projects by contractors and is probably the most logical choice as Counterparts for foreign Contractors. PDAMs have no responsibility or capability for construction.

The Director of Urban and Rural Affairs will delegates, through the Directorate of Eastern Region, a provincial government officer to act as the Project Manager for the project at each phase. It will also dispatch a coordinator for the monitoring and coordination of on-site works. The coordinator will go to the site for inspection and for meeting from time to time. The implementation arrangements are proposed as shown in Figure A11-2.2 (Plan 1) and Figure A11-2.3 (Plan 2) for Plan 1 development and Plan 2 development, respectively.

It is also advisable that the donor, whoever that might be, retains authorization control over design, design change, technical supervision, performance monitoring, schedule control and financial control. The current situation is that the water supply pipelines are usually constructed 20 cm to 30 cm below the ground surface in the cities and rural villages, but they are designed 70 cm to 100 cm below the ground as standardized in AKS Gambar-Gambar Standar, Cipta Karya in the country.

11.2.3 Ownership, Operation and Maintenance

The ownership, management, operation and maintenance of rural water supply systems in Indonesia can be undertaken by the local PDAM, by a village WUA or by a combination of both. Bylaw decisions in this area are entirely at the discretion of the Bupati. In practice the decision is usually obvious, PDAMs will continue to manage all water supply facilities in villages where they already have a presence, and they will be required to assume responsibility for systems which serve more than one village or involve relatively sophisticated pumping facilities and metered distribution networks. Villages themselves will own and manage small gravity systems in remote areas.

11.2.4 Cost Sharing

The cost of all construction works up to and including the final stop-valve in the case of house connections, and all works in the case of public hydrants and public taps, will be financed by the project, including all consultancy and supervisory services. The cost of land acquisition and compensation (if any) will be borne by GOI. Connection from the final stop-valve to facilities inside buildings is the responsibility of the property owner, although this service is usually provided by the PDAM (for a fee).

11.2.5 Land Acquisition and Compensation

It is not anticipated that land acquisition and/or compensation will be a significant factor in the implementation of the project. These matters are usually dealt with summarily by the local Kepala Desa or Kepala Suka. The village WUA will be responsible for the detailed siting of most of the system facilities and are best qualified to deal with any potential problems by choosing a different location.

Land for pipelines can be used without payment, providing the land is reinstated after the work is completed. The only area where compensation is likely to be required is if crops are damaged or destroyed during construction. Even this eventuality can be avoided by sympathetic planning.

Land acquisition may only be required for the facilities and large areas such as wells and reservoirs. The land for pipelines can be possessed and acquired without payment in principle, on the conditions that the land should be reinstated after the works.

11.2.6 Employment of Consultant

An independent consultant will be employed for each phase of the project, to conduct detailed design, construction supervision and rural extension services.

11.2.7 Procurement of Works

Construction will be carried out through separate contract packages for Phase 1 and Phase 2. If the project is funded by grant-aid, the contracts will be let to bidders selected through donor nation competitive bidding. If loan funds are provided, selection would probably be by ICB. In either case Pre-qualification (PQ) will be required prior to bidding. The selected contractors will be required to manage all construction activities, including the employment of locally hired staff, material purchase, equipment and transport hiring and performance on site.

11.2.8 Implementation Schedule

After the completion of this Study, the following activities will be carried out before the commencement of construction works.

1) The financing arrangements will be agreed.
2) An Environmental Impact Assessment (EIA) will be carried out.
3) Any land acquisition problems will be resolved.
4) Consultants will be selected.
5) Detailed designs and tender documents will be prepared.
6) Social preparation will be carried out in the villages, including the creation of WUAs and the writing of VAPs.
7) Contractors will be pre-qualified and selected.

The social preparation, training and extension activities will be carried out by consultants simultaneously with the design works, in order to ensure the villagers' acceptance of the proposed projects. After the completion of the construction works, a one-year maintenance period will be provided during which the contractor remains liable for defect repair.

Proposed implementation schedules are shown in Figure A11-2.4 (Plan 1) and Figure A11-2.5 (Plan 2) for Plan 1 development and Plan 2 development, respectively.

11.3 Scope of Works

11.3.1 Scope of Works

Construction works, under two packages of contract, will be performed for seventeen villages that are spread across the East and West Nusa Tenggara Provinces as shown in Figure A11-2.1.

Works will provide (new construction, rehabilitation and both) a rural water supply system composed of the intake, reservoir, treatment, transmission and distribution facilities at each village. The most major work is the construction work of pipelines that are to be laid underground about 1 m below the ground surface. In particular, the laying of house connection pipe accounts for much of the work, comprising about half of the total pipeline length of the project. The materials to be used in the pipeline system are PVC (polyvinyl chloride) pipe and GS (galvanized steel) pipe, having a diameter of between 50 mm and 150 mm.

The intake facilities are designed for spring water from the foot of a mountain (6 Nr.), for tube wells (2 Nr.), for shallow wells (1 Nr.) and for tapping from a present water system (10 Nr.), depending on the present condition of the water supply condition in the villages. The transmission line will be constructed with GS pipe having a diameter of between 50 mm and 150 mm. The reservoirs are structures grounded with masonry or elevated with reinforced concrete. The distribution facilities have numbers of public hydrants. Each of the hydrants has a FRP (fiber reinforced plastics) tank of 2 m^3 or 3 m^3 in capacity and several faucets.

Details of the scope of works are given in a matrix of Table A11-3.1. The following is an outline of the scope of works by village.

Scope of works

Island	Serial No., JICA #, and village	Water source	Served area	Works	Total pipeline L
			(ha)		(m)
Lomb	1/ NTB 1. Kuranji	E	28	- Construction of distribution system including a main distribution pipeline from existing PDAM pipeline network	6,020
	2/ NTB 2. Bajur	E	25	- Construction of distribution system including two main distribution pipelines from existing PDAM pipeline network	14,073

Island	Serial No., JICA #, and village	Water source	Served area	Works	Total pipeline L
			(ha)		(m)
	3/ NTB 3. Sembung	E	16	- Construction of distribution system including a main distribution pipeline from existing PDAM pipeline network (blow-off valve)	6,010
	4/ NTB 4a. Duman, upper	S	26	- Reconstruction of distribution system	10,820
	5/ NTB 4b. Duman, lower	E	48	- Construction of distribution system including a main distribution pipeline from existing PDAM pipeline network (reservoir)	9,490
	6/ NTB 10. Bagik Papan	E (S)	19	- Rehabilitation of existing distribution system in three hamlets - Construction (extension) of a distribution pipeline to the Bagik Papan hamlet - Construction of a distribution system in the Bagik Papan hamlet	8,800
	7/ NTB 11. Selapang	E (S)	15	- Improvement of existing distribution system (regional system) in the Selaparang Timur hamlet	18,160
Sbwa	8/ NTB 13. Labuhan Mapin	S	29	- Rehabilitation of existing distribution system - Construction of a reservoir at No. 6 BPT (Break Pressure Tank), EL. 90 m, upper from the Mapinrea hamlet	10,270
	9/ NTB 14. Labuhan Lalar	W	42	- Construction of a new water system consisting of: - Tube well intake facility at the existing test borehole; - Transmission facilities; and - Distribution facilities.	11,160
	10/ NTB 16. Piong	W	19	- Construction of a new water system consisting of: - Tube well intake facility by new boring; - Transmission facilities; and - Distribution facilities.	6,830
	11/ NTB 18a. Kawuwu, lower	W	5	- Construction of a new water system consisting of: - Shallow well intake facility by new digging work; - Transmission facilities; and - Distribution facilities.	1,370

Island	Serial No., JICA #, and village	Water source	Served area	Works	Total pipeline L
			(ha)		(m)
	12/ NTB 18b. Kawuwu, upper	E (S)	6	- Rehabilitation of existing distribution system, such as: - Partly replacement of pipeline; - Addition of a public hydrant; and - Replacement (enlargement) of an existing public hydrant at a school.	300
	Sub-total for NTB		278		103,303
Flor	13/ NTT 6. Sinar Hading	NTT 7	10	- Construction of a new water system consisting of: - A reservoir; and - Distribution network.	7,490
	14/ NTT 7. Ile Padung	S	10	- Reconstruction of existing water supply system, such as: - A spring intake; - Pump mains; - A stop valve and a bulk meter installation (at the village boundary); - Three concrete reservoirs; and - Distribution pipelines.	11,580
Sumb	15/ NTT 18. Weerame	S	45	- Construction of a water supply system and connection to the existing pipeline system, such as: - Cavern intake facilities with pump; - A reservoir; - Distribution main; and - Connection to existing pipeline system.	8,740
	16/ NTT 19. Kondamara	E (S)	306	- Rehabilitation of existing system such as; - Improvement of main header tank; - Distribution main; and - Distribution network.	8,960
Rote	17/ NTT 21. Oebau	S	8	- Construction of a water supply system such as; - Cavern intake facilities with pump; - A reservoir; - A break pressure tank; - Distribution main; and - Distribution network.	6,590

Island	Serial No., JICA #, and village	Water source	Served area	Works	Total pipeline L
			(ha)		(m)
	18/ NTT 23. Nusakdale	S	16	- Reconstruction of existing water supply system such as: - Spring intake facilities; - Distribution main; and - Distribution network.	2,900
Timo	19/ NTT 24. Tarus	E (S)	95	- Construction of water supply system including rehabilitation of existing intake facilities such as: - Rehabilitation of existing spring intake; - Two new reservoirs; - Distribution mains; and - Distribution network.	23,580
	Sub-total for NTT		490		69,840
	Total of NTB and NTT		**768**		**173,143**

Note:
- Names of islands are abbreviated: Lombo< Lombok, Sbwa< Sumbawa, Flor< Flores, Sumb< Sumba, Rote= Rote, and Timo< Timor.
- The length of pipeline and the served area are roughly estimated. They do not indicate precise value, and they may be changed after the design in this study.
- The Duman and Kawuwu villages have works for two water systems each.
- Water sources "S", "W", and "E" mean spring water, tube or shallow well, and existing water system, respectively.
- "E (S)" means that the works will require tapping or diverting from an existing system that has the water source of spring.
- "Pipeline L., total" indicates the total length of PVC (polyvinyl chloride) pipe and GS (galvanized steel) pipe including service pipelines to public hydrants and house connections, but excluding pipes for crossing structures.

11.3.2 Major Work Quantities

The following are the major work quantities.

Major work quantities

Island	Villages	Excavation	Concrete	Masonry	PVC pipeline	GS pipeline	HC	PH	Pump
		(m3)	(m3)	(m3)	(m)	(m)	(Nr.)	(Nr.)	(Nr.)
NTB									
Lomb	1/ NTB 1. Kuranji	3,092	117	2	2,640	3,380	114	17	0
	2/ NTB 2. Bajur	7,124	235	5	2,738	11,335	490	35	0
	3/ NTB 3. Sembung	3,095	117	3	2,312	3,698	134	17	0
	4/ NTB 4a. Duman, upper	5,753	335	6	3,880	6,940	123	33	0
	5/ NTB 4b. Duman, lower	4,971	124	7	5,368	4,122	116	18	0
	6/ NTB 10. Bagik Papan	4,566	213	6	4,488	4,312	127	30	0
	7/ NTB 11. Selapang	9,338	144	6	5,424	12,736	549	15	0
Sbwa	8/ NTB 13. Labuhan Mapin	5,123	45	4	1,448	8,822	446	7	0
	9/ NTB 14. Labuhan Lalar	5,879	176	8	5,496	5,664	188	24	1
	10/ NTB 16. Piong	3,504	107	0	3,088	3,742	133	13	1
	11/ NTB 18a. Kawuwu, lower	714	41	0	712	658	17	3	1
	12/ NTB 18b. Kawuwu, upper	162	20	4	160	140	0	3	0
	Sub-total for NTB	53,321	1,674	51	37,754	65,549	2,437	215	3
NTT									
Flor	13/ NTT 6. Sinar Hading	3,801	66	0	2,520	4,970	207	5	0
	14/ NTT 7. Ile Padung	6,109	108	4	6,152	5,428	180	7	4
Sumb	15/ NTT 18. Weerame	4,439	82	0	2,640	6,100	259	8	2
	16/ NTT 19. Kondamara	4,669	116	11	5,600	3,360	73	15	2
Rote	17/ NTT 21. Oebau	3,493	114	3	4,824	1,766	13	10	1
	18/ NTT 23. Nusakdale	1,533	48	9	2,000	900	9	6	0
Timo	19/ NTT 24. Tarus	12,075	133	6	8,400	15,180	636	13	4
	Sub-total for NTT	36,119	667	33	32,136	37,704	1,377	64	13
	Total of NTB & NTT	**89,440**	**2,341**	**84**	**69,890**	**103,253**	**3,814**	**279**	**16**

Note:
- Names of islands are abbreviated: Lombo< Lombok, Sbwa< Sumbawa, Flor< Flores, Sumb< Sumba, Rote= Rote, and Timo< Timor.
- The work quantities are roughly estimated. They do not indicate precise value.
- The Duman and Kawuwu villages have two water systems each.
- Masonry includes wet masonry, dry masonry and gabion mattress.
- Quantities of PVC and GS pipelines indicate the total length of the transmission and distribution systems including branch pipe for the house connection and public hydrant. The diameter of PVC and GS pipelines range between 50 mm and 150 mm.
- "HC" means house connection. One house connection has one faucet. Every GS pipe of about 20 m long, a connection pipe to be placed for each of the house connections, is counted under the "GS pipeline" column.
- "PH" means public hydrant. One public hydrant has a FRP (Fiber Reinforced Plastics) tank, and several faucets. The capacity the FRP tank is 2 m3 to 3 m3. Every GS pipe of about 20 m long, a connection pipe to be placed for each of public hydrants, is counted under the "GS pipeline" column.
- Submergible pumps will be installed at mainly well source sites. The diameter of pump ranges between 40 mm and 150 mm.

11.4 Conditions and Assumption for Planning

11.4.1 Natural and Social Conditions

(1) Location

The project area is located between S 8° and S 11° longitude and E115° and E125° latitude. The villages to be developed are located on six islands, i.e. Lombok, Sumbawa, Flores, Sumba, Rote, and Timor.

These islands are located east of Bali Island, and south of Sulawesi Island in Indonesia. These six islands stretch east and west about 1,000 km from tip to tip between the Flores Sea and the Indian Ocean.

Project area is shown in Figure A11-2.1.

(2) Geology

The Lombok, Sumbawa, Sumba, Flores, Rote and Timor islands form a part of the Lesser Sunda Islands.

The Nusa Tenggara area can be divided into two rock areas, i.e. volcanic rock and sedimentary rock. The volcanic rock areas covering the Lombok, Sumbawa, and Flores islands are mainly of andesitic and basaltic composition of volcanic breccia, lahar, tuff, ash and lava. Sedimentary rocks of the Tertiary to Quaternary age are widely distributed in the islands of Sumba, Rote and Timor, consisting mainly of limestone, clayey limestone intercalated with sandy marl and tuffaceous marl, marly sandstone, tuffaceous sandstone, sandy marl, limestone intercalations, coral limestone.

(3) Topography

Topographically, the islands in NTB and NTT are dominated by mountainous areas with very rugged topography, consisting of a number of young volcanoes and old volcanic cones, particularly on the islands of Lombok, Sumbawa, and Flores. The islands of Sumba, Rote and Timor are composed of sedimentary rocks, having only a small percentage of flat areas.

The topography of every village is tabulated in Table A11-4.1.

(4) Vegetation

Lombok Island is well covered with green vegetation. The other islands of Sumbawa, Flores, Sumba, Rote and Timor are more sparsely covered with green vegetation.

In each island, the areas of spring intakes and their transmission lines for the villages are usually at higher elevations and are covered with forest dominated by palm trees (girth: 50cm to 80cm, density: a tree per $200m^2$ to $400m^2$). The areas of villages and hamlets, where people have houses, are vegetated with garden trees such as palm trees, banana, mango, etc. The areas between villages and hamlets are usually cultivated to paddy and upland fields. Maize, tobacco, cassava, banana, palm trees, etc are cropped in the upland fields.

(5) Climate

The islands of Nusa Tenggara lie in the flora and fauna transition zone between southeast Asia and Australia, as marked by the imaginary Wallace line which passes between Lombok and Bali islands. Their climates are strongly influenced by both the continents of Asia and Australia. The distinct wet season is related to the Asiatic northwest monsoon from November to April, whereas the dry season is related to the southeasterly Australian winter anticyclone. The islands are subjected to a prolonged dry season, with rainfalls of less than 250 mm during a period from May to October.

Statistically, five gauging stations in the Nusa Tenggara area receive precipitation of less than 1,000 mm/year in the 1/10 drought year. In particular, Waingapu in Sumba Island receives only 586 mm of rainfall in the 1/10 draught year. The data indicates that both NTB and NTT are under such severe conditions that water resources must be considered to be extremely limited.

The following are the averaged monthly precipitation at eight observatories in the project area.

Averaged monthly rainfall

Observatory: Gunung Sari, Lombok (1991-2000) (Unit: mm)

Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
174	260	213	139	129	46	84	8	29	209	245	201	1,737

Observatory: Slaparang, Lombok (1991-1995) (Unit: mm)

Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
203	347	213	175	66	38	16	3	15	181	213	154	1,624

Observatory: Sumbawa Besar, Sumbawa (1991-1994) (Unit: mm)

Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
242	286	140	107	17	6	4	0	4	26	106	209	1,147

Observatory: Bima, Sumbwa (1991-1995) (Unit: mm)

Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
257	157	137	37	5	8	2	1	3	16	116	153	892

Observatory: Konga, Flores (1997-1998) (Unit: mm)

Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
167	136	22	109	0	61	0	36	2	10	138	241	922

Observatory: Maliru, Sumba (1997-1998) (Unit: mm)

Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
108	23	59	130	15	10	3	1	10	11	68	239	677

Observatory: Tarus 010Kup, Timor (1980-1995) (Unit: mm)

Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
399	361	141	65	12	10	6	1	3	4	104	176	1,282

Figure A11-4.1 shows the location of the observatories. Figure A11-4.2 and Table A11-4.2 shows averaged monthly rainfall at each of the observatories.

(6) Seaport and airport

Each of the islands, Lombok, Sumbawa, Flores, Sumba, Rote and Timor, has freighter (cargo ship) port and ferry port. Small freighters enter each freighter port every day. Rather large freighters enter each port about twice a month. Large freighters are usually scheduled to navigate among the islands in NTB and NTT, Sulawesi and Kalimantan based at the Surabaya and Jakarta ports. Ferries enter each ferry port a few to several times a day. Navigation of the freighters and ferries is illustrated in Figure A11-4.3.

Each of the islands has also an airport. Two air companies, Merpati and Air Mark, occupy the airways in the area of Nusa Tenggara. Merpati has many flights to the East and West Nusa Tenggara provinces, based at Dempasar Airport in Bali. Air Mark has flights to Dempasar and Bima based at the Mataram Airport in Lombok. The Dempasar and Mataram airports are connected to Jakarta Airport by Garuda Air. Mataram Airport has the most flights in Nusa Tenggara, mainly to and from Dempasar and Jakarta. The flight schedule for the NTB and NTT is charted in Figure A11-4.4.

(7) Access roads

It is possible to access each of the villages by vehicle using public roads from the seaports. Distance from seaport to each of the villages is listed in Table A11-4.1.

- Lombok Island

All the villages are connected to the national roads, provincial roads and district roads. These roads are asphalt roads and maintained in a good condition. Access to each village is considered to be easy. Almost all villages are located along these roads. In the villages areas, main roads of the villages are made with asphalt pavement. However, surface pavements have broken up in places in some village, resulting in gravel road conditions. Also, earth roads were noted between some hamlets.

Surveyed villages are located 10-20 km from each provincial office.

Springs (Kuranji, Sembung, Bagik Papan) are located within the village and access is made using narrow earth roads. Springs, (Duman, Bagik Papan, Selaparang) which are situated in the forests, and rivers are located quite far from the village. Accessibility is considered to be fair to poor.

- Sumbawa island

Almost all villages are located along national roads, provincial roads and district roads. These roads are asphalt roads and maintained in a good condition. Access to each village seems to be easy. Desa Kawuwu is located in a mountainous area and access is by a rough and steep road. In the village, the village main roads are made mainly with asphalt pavement. However, the surface pavement is broken in places and in some village the exposed base and sub-base materials provide gravel road conditions.

The surveyed villages are located 50-100 km from the provincial office, except Labuhan Lalar (135 km).

Access to each spring is quite far from the relevant village; 10 km from Labuhan Mapin, 3.5 km from Labuhan Lalar, and 1.5 km from Piong. These springs are situated in a mountainous forest, agricultural area and river/stream side respectively. The access to each spring is a narrow earth road used as a footpath.

- Flores island

Access to all the village is available by national roads, provincial roads and district roads. The national road of about 4 m wide is asphalt pavement and in good surface condition. The access to each village is relatively easy.

The distance from Bupati Office of Flores Timur to each village office is 19 km to 23 km.

In Kabupaten Flores Timur, the access to all the village is by national road and district road. The village road of Desa Ille Padung is paved with concrete, and the surface condition is fair. Access to the site and other hamlet is mainly by foot.

- Sumba island

Access to all the village is by national road, provincial and district roads. The distance from Bupati Office of the Sumba Timur to the Kondamara village office is about 60 km. The distance from Bupati Office of Sumba Barat to the Weerame village office is about 20 km. The national road of about 4 m wide is asphalt pavement.

The district roads of Sumba Timur are mainly paved with gravel and earth. They are in good condition, sufficient for daily traffic. The village roads are also paved gravel and earth, but the surface of the road is not in good condition. Access to springs and other hamlet is mainly by foot.

Many of the provincial roads of Sumba Barat are asphalt pavement, which are in good condition. The village roads are also paved with gravel and earth. But, they are not in good condition. Access to springs and the other hamlet is mainly by foot.

- Rote island

Access to all the village is available by district road. The distance from Chamat Office of Pantaibaru to each village office is between 10 km and 17 km.

District roads are narrow and unpaved. The road surface is gravel and earth, and in rough surface condition. Access to Desa Nusakdale is considered to be difficult for normal traffic during the rainy season because there are no bridges and vehicles have to ford rivers or use ferries.

The village roads are paved with earth and gravel. Access to springs and other hamlet is by foot.

- Timor island

Access to the Tarus Desa is by national road and district roads. The distance from the provincial office of Kupang to the village office is about 13 km.

These roads are paved with asphalt, and access to the village is quite easy. The village road is paved with asphalt or gravel and earth. Access to the springs and other hamlet is mainly by foot.

(8) Infrastructures and service facilities

1) Power supply

(a) Lombok island

All the proposed villages are connected to the existing 11 kV electric distribution line of PLN and stepped down to 440 V in each village. Two villages in Lombok Timur, Bagik Papan and Selaparang, are connected to another electric supply system of KLP (Koperasi Listrik Pedesaan "Sinar Rinjani").

(b) Sumbawa island

All the proposed villages are connected to the existing electric distribution line of PLN.

(c) Flores island

Almost all the proposed villages are connected to the existing electric distribution line of PLN, except for Flores Timur. However, some hamlets do not have a distribution line.

(d) Sumba island

Kondamara village is not connected to the existing electric distribution line of PLN, but is connected to Weerame.

(e) Rote island

None of the proposed villages are connected to the existing electric distribution line of PLN.

(f) Timor island

The proposed village is connected to the existing electric distribution line of PLN.

2) Telecommunication system

(a) Lombok island

Wired telephone line is not provided for each village. Each Kepala Desa has a mobile telephone.

(b) Sumbawa island

Wired telephone line is not provided for each village. Each Kepala Desa has a mobile telephone.

(c) Flores island

Wired telephone line is not provided for each village. Communication with the village is by a transceiver, car or motorcycle.

(d) Sumba island

Wired telephone line is not provided for each village. Communication with the village is by car or motorcycle.

(e) Rote island

Wired telephone line is not provided for each village. Communication with the village is by car or motorcycle.

(f) Timor island

The village is connected to the existing electric distribution line of PLN.

(9) Institutions

1) Labor law

(a) National holidays

There are fourteen (14) National holidays a year in Indonesia. There is no holiday in lieu of a National holiday that falls on a Sunday. The National holidays in Indonesia are listed in Table A11-4.3.

(b) Working hours and wage

Standard working hours are set at 40 hours a week as tabulated below.

Weekly working hours instructed by the government

Date of the week	Working hours	Calculation
1. Mon. - Fri.	35	08:00-16:00, 7 hours/day x × 5 days
2. Sat.	5	08:00-13:00, 5 hours/day x × 1 days
Total	40	

Source: Counseling Guide for Company Regulations

It is customary in the construction industry to set working hours of 42 hours, exceeding the above standard working hours.

Actual practiced working hours in construction industry

Date of the week	Working hours	Calculation
1. Mon. - Sat.	42	08:00-16:00, 7 hours/day x × 6 days
Total	42	

Source: Hearing survey

It is possible for employers to have workers exceed the standard working hours where he gets previous permission from the human power resources department. An overtime allowance is regulated, calculated as follows.

Overtime allowance

Working day	Overtime hours	Overtime allowance
1. Normal	- first 1 hour:	Standard hourly wage ×1.5
Mon. - Sat.	- exceeding 1 hour:	Standard hourly wage × 2
2. Holiday of	- first 7 hours:	Standard hourly wage × 2
Mon. - Fri.	- exceeding 7 hours to 8 hours:	Standard hourly wage × 3
	- exceeding 8 hours:	Standard hourly wage × 4
3. Holiday of	- first 5 hours:	Standard hourly wage × 2
Saturday	- exceeding 5 hours to 6 hours:	Standard hourly wage × 3
	- exceeding 6 hours:	Standard hourly wage × 4

Source: Counseling Guide for Company Regulations

Note:
- Overtime for Sunday is calculated in accordance with "2. Holiday of Mon. - Fri.".
- Standard hourly wage is taken as three twentieths (3/20) of the daily wage, or one hundred and seventy third (1/173) of the monthly wage.

Employers must give paid leave of 12 days a year to workers that have worked for him for more than 12 months. He must also pay a bonus of one month every year to workers who been with him for more than a year.

Employer must pay insurance fees as follows.

Insurance to be borne by employer

Name of insurance	Insurance rate to basic wage
1. Employer's Provident Fund	3.70 %
2. Employer's Health Insurance	6.00 %
3. Employer's Accidental Insurance	1.74 %
4. Employer's Death Insurance	0.30 %
Total	11.70 %

Source: Counseling Guide for Company Regulations

2) Environmental act

The following environmental acts will be respected by contractors during construction.

(a) Government Regulation of the Republic of Indonesia No. 20 of 1990 concerning

'Control of Water Pollution',

BAPEDAL (Environmental Impact Management Agency) with EMDI (Environmental Management Development in Indonesia), 1990

(b) Act of the Republic of Indonesia No. 4 of 1982 concerning

'Basis Provisions for the Management of the Living Environment',

BAPEDAL (Environmental Impact Management Agency), 1996

(c) Government Regulation of the Republic of Indonesia No. 41 of 1999 concerning

'Control of Air Pollution',

BAPEDAL (Environmental Impact Management Agency), 1999

11.4.2 Availability of Construction Resources

(1) Labor

Unskilled workers will be employed in and around the villages proposed for the works.

Skilled workers, such as concrete workers, form workers, pipe plumbers and operators, will be employed at Surabaya or Jakarta for the large scale construction works.

(2) Construction materials

1) General

Primary materials of earth and rock materials are available in and around the villages proposed for the works. Artificial construction materials required in large quantities, such as fuel, cement, rebar, pipes and gates will be purchased mainly at Surabaya or Jakarta.

(a) Lombok island

For the construction of water supply facilities such as pipelines, hydrant, wells, etc., unskilled labor and raw materials of gravel and sand are available in the villages. However, pipes, valves, pumps, cement, reinforcing steel, etc. will be transported from Mataram or Surabaya.

(b) Sumbawa island

For the construction of water supply facilities such as pipeline, hydrant, wells, etc., unskilled labor and raw materials of gravel and sand are available in the village. However, pipes, valves, pumps, cement, reinforcing steel, etc. will be transported from a town closest to the village, Mataram or Surabaya.

(c) Flores island

Raw materials of gravel and sand are available in the villages of Sinar Hading. Unskilled labor is available in all the villages. Major materials such as pipes, valves, pumps, cement, reinforcing steel, etc. and construction equipment will be transported through the Maumere and Larantuka ports.

(d) Sumba island

Raw materials of gravel and sand are not available in the villages except Weerame. Unskilled labor is available in all the villages. Major materials such as pipes, valves, pumps, cement, reinforcing steel, etc. and construction equipment will be transported through the Waingapu port.

(e) Rote island

Raw materials of gravel and sand, and unskilled labor are available in all the villages. Major materials such as pipes, valves, pumps, cement, reinforcing steel, etc. and construction equipment will be transported through the Pantai Baru port from Kupang.

(f) Timor island

Raw materials such as gravel and sand, and unskilled labor are available in all the villages. Major materials such as pipes, valves, pumps, cement, reinforcing steel, etc. and construction equipment will be transported through the Kupang port.

(3) Construction equipment

Some construction equipment is available in each of the islands from time to time. Where suitable equipment is not available, it will be transported from Surabaya by ship.

11.4.3 Basic Conditions of Construction Works

(1) General

Conventional and prevailing construction methods are adopted as much as possible.

The major work of the proposed construction works is pipe laying work. This work will be mainly performed manually because there is poor availability of construction equipment and the proposed route of the pipeline is over rather steep land and along narrow village streets.

Wells will be bored with boring machines.

Concrete will be mixed and placed manually. The work volumes of the structures the overall project are too small to require heavy concrete equipment. Portable concrete mixers will be operated from time to time, depending on the quantity of the works.

Construction equipment, such as trucks with cranes, will be used for installing pumps.

Masonry works will be done manually.

(2) Bulk factors

The following are swell and shrinkage factors assumed for earth/rock volume conversion.

Bulk factors

No.	Materials	Bank	Loose	Compacted
1.	Soil	1.00 (1.80)	1.20 (1.50)	0.90 (2.00)
2.	Rock	1.00 (2.44)	1.60 (1.53)	1.25 (1.95)
3.	Aggregate, river sand	1.00 (1.80)	1.20 (1.50)	0.90 (2.00)
4.	Aggregate, gravel	1.00 (1.90)	1.20 (1.58)	1.00 (1.90)

Note: - The value in parentheses indicates unit weight in tf/m^3.

(3) Working hours

One shift working hours are applied to the works. The following are one shift working hours.

Normal working hours

Day of the week	Working hours	
Monday-Saturday	7 hours in net	(8.5 hours in gross from 8:00 to 16:30, 1 hour for lunch, 15 minutes rest each in the morning and afternoon teas)
Sunday	no work	
National holiday	no work	

(4) Workable days

Workable days are estimated, depending on the type of works, based on the precipitation data recorded at the observatories in the project area.

Annual net workable days available for construction works are estimated based on the following conditions, depending on the type of works.

Conditions of work suspension days

Day of the week/rainfall	Earthworks	Concrete works
1. Sunday and national holidays:	1.0	1.0
2. Rainfall (p):		
0mm $\leq$ p < 5mm	0	0
5mm $\leq$ p < 10mm	0	0
10mm $\leq$ p < 20mm	0.5	0
20mm $\leq$ p < 40mm	1.0	1.0
40mm $\leq$ p	1.5	1.0

Note: - Overlapping days of Sunday/holiday with rainy days shall be deducted in counting work suspension days.

The workable days are estimated on monthly basis through the following steps.

(1) Listing and counting Sundays and National holidays
(2) Counting rainy days
(3) Listing number of rainy days
(4) Estimating work suspension days due to rainfall
(5) Estimating workable days

The process of the above steps is listed in Table A11-4.4. The following are the estimated workable days depending on the type of works.

Estimated workable days (1/4)

Observatory	Gunung Sari, Lombok (NTB)		Selaparang, Lombok (NTB)	
Month	Earthworks	Concrete works	Earthworks	Concrete works
January	23	24	22	24
February	17	19	15	17
March	21	22	20	22
April	22	23	21	22
May	23	24	23	24
June	25	26	25	25
July	25	25	26	26
August	26	26	26	26
September	24	25	25	25
October	23	24	23	24
November	21	23	21	23
December	19	21	20	21
Total	**269**	**282**	**267**	**279**

Estimated workable days (2/4)

Observatory	Sumbawa Besar, Sumbawa (NTB)		Bima, Sumbawa (NTB)	
Month	Earthworks	Concrete works	Earthworks	Concrete works
January	21	23	20	23
February	16	18	20	21
March	23	24	23	23
April	21	22	23	24
May	24	24	24	24
June	26	26	26	26
July	26	26	26	26
August	26	26	26	26
September	25	25	25	25
October	26	26	26	26
November	24	25	24	25
December	19	21	20	21
Total	**277**	**286**	**283**	**290**

Estimated workable days (3/4)

Observatory	Konga, Flores (NTT)		Maliru, Sumba (NTT)	
Month	Earthworks	Concrete works	Earthworks	Concrete works
January	23	24	24	24
February	18	19	22	22
March	25	25	24	25
April	22	23	21	22
May	24	24	24	24
June	25	25	26	26
July	26	26	26	26
August	25	25	26	26
September	25	25	25	25
October	26	26	26	26
November	23	25	24	25
December	18	20	17	19
Total	**280**	**287**	**285**	**290**

Estimated workable days (4/4)

Observatory	Tarus 010 Kup (NTT)	
Month	Earthworks	Concrete works
January	18	21
February	14	17
March	22	23
April	23	24
May	24	24
June	26	26
July	26	26
August	26	26
September	25	25
October	26	26
November	24	25
December	20	21
Total	**274**	**284**

The workable days estimated, based on the rainfall record of the Gunung Sari observatory, Lombok, are used for construction planning of the works in all the proposed villages in NTB and NTT for the following reasons.

- The rainfall data used for the estimate of workable days is much less (2 to 5 years data for an observatory, except 16 years for Tarus 010 Kup, Timor) than those of the Gunung Sari observatory (10 years data). The data of Gunung Sari is more reliable than the others.
- The workable days of 269 for earthworks are more conservative for formulating construction plans than the other estimates (274, 277, 280, 283, 285 days).
- The proposed works are not so large scale or complicated as to require different locations of data for construction planning. A single reliable data source is adequate to plan the proposed works.

(5) Production rate of construction equipment

Heavy equipment such as backhoes, dump trucks and boring machines have the potential to be used for the works. The production rates of backhoes and dump trucks are computed in Table A11-4.5.

The following are the production rates computed.

Production rate of construction equipment

Equipment	Job	Unit	Production rate	(measurement type)
Backhoe, 0.35m^3	excavation, common	m^3/hr	19	(bank)
Backhoe, 0.6m^3	excavation, common	m^3/hr	33	(bank)
Backhoe, 0.35m^3	placing and spreading	m^3/hr	25	(embankment)
Backhoe, 0.6m^3	placing and spreading	m^3/hr	43	(embankment)
Vibratory plate compactor, 70-80kg	hauling, 5km	m^3/day	38	(embankment)

(6) Proportioning of concrete

Mixing proportions of concrete are assumed as below.

Proportioning of concrete

(per 1.0m^3 concrete)

Type	Strength	Max aggr.	Water	Cement	F. aggr.	C. aggr.	Admixt.
	(N/mm^2) [kgf/cm^2]	(mm)	(kg)	(kg)	(kg)	(kg)	(lit.)
	175 [17.9]	40	114	300	770 (0.51)	1,200 (0.76)	1.00

Note: - Value in parentheses indicates volume of aggregates in loose condition in cubic meters.

(7) Curing days of concrete

The following curing period is scheduled for the concrete work program.

Curing days of concrete

Position of works	Removing form	Load/backfilling
Form for lining concrete	1 day	1 day
Vertical formwork to column and wall	7 days	7 days
Soffit formwork to slab	14 days	21 days

(8) Disposal area

The quantity of surplus materials is not so great as to require consideration of providing a disposal area. The surplus earth materials will be disposed beside the work site and leveled to the shape of the original ground.

11.5 Construction Method and Sequence

11.5.1 Temporary Works

(1) Access road

Since there are public roads to all villages, it is not necessary to construct new access for the villages proposed for the works. All the materials and equipment for the works will be transported up to the villages using existing public roads. Only maintenance works of the existing roads will be required for the works and for daily traffic.

The construction materials will be carried by manpower from the villages to the water sources and reservoirs, where there are no public roads for vehicles.

(2) Power supply

Electrical power will be supplied by diesel engine generator to execute the works.

(3) Water supply

The water, that is required for concrete production and for moisture control for filling works, will be supplied from the source of each water system by pump and water tanker. If the water source is far from the construction site, the water would be brought from other rivers and streams.

(4) Telecommunication system

Contractors will establish a radio communication system covering all the work sites and offices, such as satellite telephone system.

(5) First aid

Other than the use of the hospitals and clinics available around the project area, first aid facilities are to be provided by the contractor at his site office.

(6) Contractor's base camp

Contractor's base camps will be located in/around the proposed villages for the works. The contractor will provide the infrastructure required for the works in the base camps.

(7) Labor camp

A labor camp for skilled and semi-skilled workers will be provided by the contractor for the smooth operation of construction works in/around the proposed villages for the works.

11.5.2 Permanent Works

(1) Intake facilities

1) Spring intake

Several Broncapturing structures will be constructed or reconstructed. Each of the structures is rather small. All the works, such as excavation, wet masonry weir, stone and gravel filling, pipe laying, concrete covering, and backfilling, will be done manually.

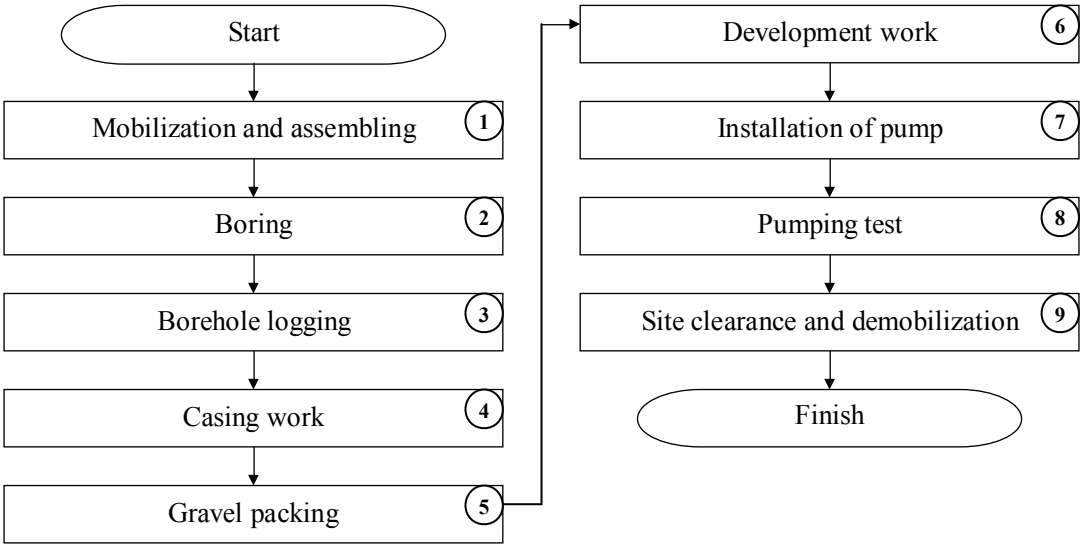
2) Cavern water intake

One cave water intake will be constructed at the Weerame and Oebau villages. There is a water cave upstream of each of the villages. A simple pump station will be constructed and a concrete slab will be placed to cover the cavern at the intake site. The work site is very steep and less excavation works will be required. All the construction works will be done manually.

3) Tube well

A tube well will be constructed at the Pion village in Sumbawa. A spindle type boring machine, 15 kW class, will be used for the boring. Well head facilities, such as the concrete pad, drainage ditch, drainage pit, and animal troughs, will be constructed manually. A portable concrete mixer will be used for mixing concrete for the concrete pad and others. A cargo truck with crane will be used for transporting and installing the pump.

The borehole construction will be performed using the following process.



Borehole construction sequence

Note: - Boring includes placing conductor pipe, boring and mud circulation.

4) Shallow well

A shallow well, of diameter 2.5 m and a depth of 4 m, will be constructed at the Kawuwu village in Sumbawa. The well will be dug manually. Well head facilities, such as the concrete pad, drainage ditch, drainage pit, and animal troughs, will be constructed manually. A portable concrete mixer will be used for mixing concrete for the concrete pad and others. A cargo truck with crane will be used for transporting and installing the pump.

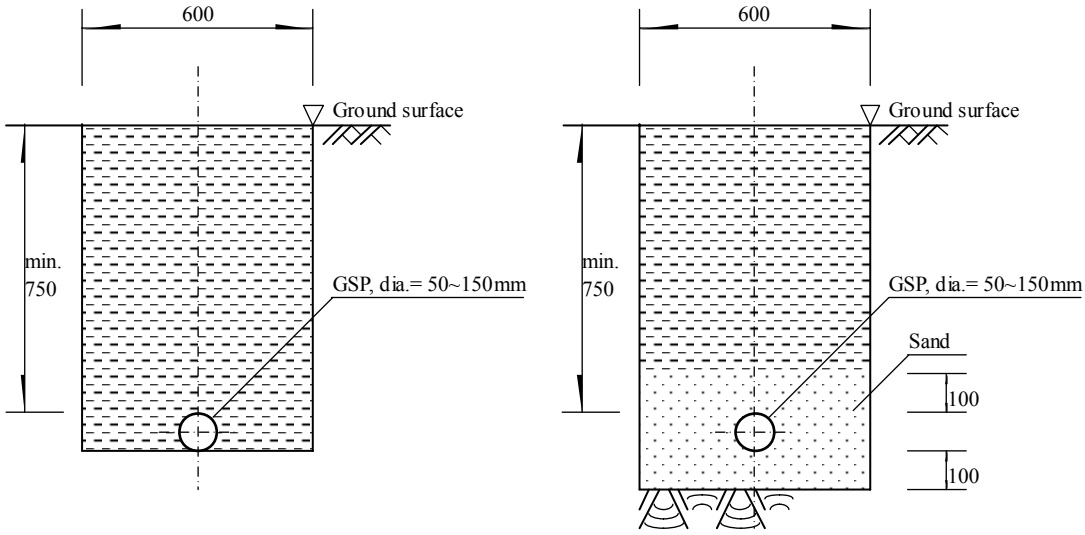
5) Tapping works from existing water supply system

Tapping and diversion works will be carried out from the existing water supply system in several villages. The tapping works will be performed blocking water by closing valves neighboring. The works will be carried out by plumbers.

(2) Transmission facilities

1) Transmission pipeline

Galvanized steel pipe (GSP), with a nominal diameter of between 50 mm and 150 mm, will be placed underground. The soil covering of the pipeline is designed to be 75 cm. An excavation depth of 80 to 100 cm will be required, depending on the pipe diameter and the soil condition of the bed. The following are typical cross sections of the laid pipeline.



(1) Earth bed **(2) Rock exposed bed**

Typical cross sections of transmission pipeline

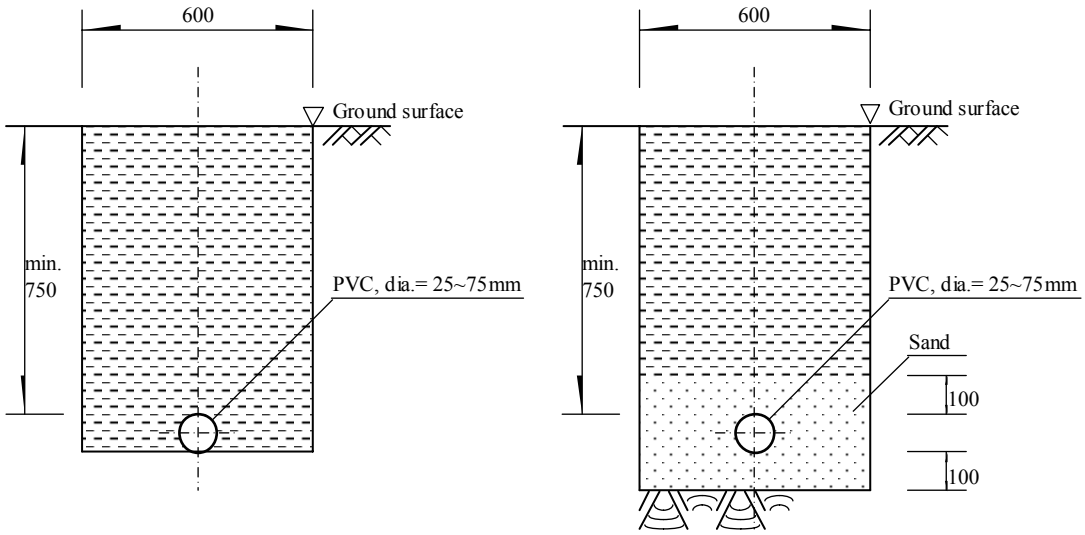
(3) Distribution facilities

1) Ground reservoir

Ground reservoirs will be constructed mainly for the spring intake systems. Excavation and masonry works will be done during the construction. All the works will be done manually.

2) Distribution pipeline

Polyvinyl chloride (PVC) pipe, with a nominal diameter of between 50 mm and 150 mm, will be placed underground. Where the pipe is exposed on steep areas, galvanized steel pipe (GSP) will be used instead of the PVC pipe, especially for the main distribution pipeline. The soil covering of the pipeline is designed to be 75 cm. An excavation depth of 80 to 100 cm will be required depending on the pipe diameter and the soil condition of the bed. The following are typical cross sections of the laid pipeline.



(1) Earth bed **(2) Rock exposed bed**

Typical cross sections of distribution pipeline

Excavation, plumbing and backfilling will be required for the construction. All the works will be done manually.

3) House connection

About 4,500 house connection pipes in total will be constructed for the project. Each of them is a PVC pipe of 25 mm diameter and about 20 m long. Excavation, plumbing and backfilling will be done manually.

4) Public hydrant and public tap

About 220 public hydrants in total will be constructed for the project. Each of them is a cylinder type tank, made of fiber reinforced plastics (FRP), with a capacity of 3 m^3, connected to several faucets for public use. A concrete pad, drainage ditch, drainage pit, and animal trough will be also be constructed.

The FRP tanks will be prefabricated at the factory for installation at the proposed site. All the works will be done manually.

11.5.3 Progress Rate of Works

(1) General

Progress rates of the works are estimated based on the productivity of workers by trade and of equipment to be operated. A certain period of work is assumed to

compute work quantities for each segment of the works. For each of the segments, a team of workers and equipment is formed to perform the works.

Progress rates of works are estimated for the physical works on site, for the period from when the construction materials and equipment are mobilized to when the works are completed.

(2) Critical Path Work

Works will be performed progressively village by village. Pipe laying works will form a critical path in the construction work program in each village, since there is more work involved than in the intake construction or rehabilitation, well exploitation, reservoir construction, BPT (Break Pressure Tank) construction and construction of crossing structures. During the pipe laying works, the other works will have been finished at each of the villages.

The pipe laying works will be performed by two kinds of work units. One is a manual team and the other is an equipment operating team. The manual team performs the works, excavation, pipe setting, jointing and backfilling, using manpower only. The equipment operating team uses a backhoe of 0.35m^3 for excavation and backfilling and a vibratory plate compactor of 70-80kg for compaction of backfilling.

The following are the estimated progress rates of the pipe laying work.

Progress rates of pipe laying works

Item	Manpowered work team	Equipment team
1. Progress rate by a team	15 m/day	237 m/day
2. Team formation		
1) Operator	-	2
2) Plumber	1	15
3) Common worker	18	28
4) Backhoe, 0.35m3	-	2
5) Vib. plate compactor, 70-80kg	-	4

Note: - The diameter of pipes to be laid ranges between 25 mm and 150 mm.
- Daily operation hours of equipment is set at 6.75.

The estimation is given in Table A11-5.1.

11.6 Construction Schedule

11.6.1 Construction Time Schedule

The construction time schedule is prepared based on the work progress of the pipe laying works. Manpowered work teams will be assigned to about 75% of the total pipeline length and equipment teams to the remaining 25% of the pipeline.

The construction schedule is prepared so that the construction resources should be deployed as uniformly through the construction period as possible. The works will not be performed at all villages simultaneously, but performed at a few villages simultaneously. The works will be progressively finished area by area.

Works for Phase 1 will require eight months including two months for mobilization. Works for Phase 2 will require seven months including two months for mobilization.

11.6.2 Required Construction Resources

(1) Labor

The following are total man-days required for the works.

Major construction equipment required for the works

Item	Unit	Phase 1	Phase 2	Total
1. Total man-days of labor	man-day	107,000	69,000	176,000

(2) Materials

The following are the quantities of major construction materials required for the works.

Major construction materials required for the works

Item	Unit	Phase 1	Phase 2	Total
1. Light oil	m3	35	37	72
2. Cement	ton	530	210	740
3. Re-bar	ton	85	35	120
4. Plywood	m3	350	150	500
5. Fine aggregate	ton	1,350	540	1,890
6. Coarse aggregate	ton	2,100	840	2,940
7. Stone for masonry	ton	100	65	165
8. PVC pipe, dia.= 25mm	m	0	0	0
9. PVC pipe, dia.= 50mm~150mm	m	43,600	36,400	80,000
10. Water tank, FRP, $3m^3$	Nr.	215	64	279
11. GS pipe, dia.= 25mm	m	56,100	29,700	85,800
12. GS pipe, dia.= 50mm~150mm	m	3,600	3,800	7,400
13. Faucet	Nr.	3,400	1,700	5,100

Note: Quantity of light oil is estimated based on the operation of backhoe that will be used for pipe laying works.
Refer to **Table A11-3.1** and Section 3.2.

(3) Equipment

The following are the number of major construction equipment required for the works.

Major construction equipment required for the works

Item	Unit	Phase 1	Phase 2	Total
1. Backhoe, 0.35m3	Nr.	4	4	8
2. Vibratory plate compactor, 70-80kg	Nr.	8	8	16

(4) Contractor's yard

The contractors will not require much office space. Since they use small numbers of equipment that are to be operated village by village, they will not require any motor pool at a location. A storage area should be used by the contractor during construction because of the quantity of pipe materials that needs to be purchased and handled for the construction.

The contractors will require an area of land near the freighter ports in Phase 1 and Phase 2.

The following are the areas needed for the storage of materials required for the works.

Estimated storage area required for the works (Plan 1)

Item	Unit	Phase 1	Phase 2	Total
1. Storage area (Phase 1)	m^2	5,000	0	5,000
2. Storage area (Phase 2)	m^2	0	2,000	2,000
Total	m^2	5,000	2,000	7,000

Note: The area is estimated assuming that about a quarter of the total materials to be purchased from outside of the villages should be stored at a time.

Estimated storage area required for the works (Plan 2)

Item	Unit	Phase 1	Phase 2	Total
1. Storage area (Phase 1)	m^2	3,000	0	3,000
2. Storage area (Phase 2)	m^2	0	4,000	4,000
Total	m^2	3,000	4,000	7,000

Note: The area is estimated assuming that about a quarter of the total materials to be purchased from outside of the villages should be stored at a time.

11.7 Consultants' Setup

11.7.1 Personnel Requirement

The following are the foreign and local experts required to execute the design, supervision, and community development and PDAM capacity building at Phase 1 and Phase 2.

Required Consultant Personnel (Plan 1)

(Unit: M/M)

Work	Phase 1 (F)	Phase 1 (L)	Phase 1 Total	Phase 2 (F)	Phase 2 (L)	Phase 2 Total	Total
1. Design	21	16	37	21	16	37	74
2. Supervision	22	51	73	21	54	75	148
3. Soft component services *1	19	234	253	14	171	185	438
Total	**62**	**301**	**363**	**56**	**241**	**297**	**660**

Note: (F): Foreign expert
(L): Local expert and staff, including field officers
*1: Field officers (L) make up a large proportion of the above personnel quantities; i.e. 154 M/M in Phase 1 and 95 M/M in Phase 2.

Required Consultant Personnel (Plan 2)

(Unit: M/M)

Work	Phase 1 (F)	Phase 1 (L)	Phase 1 Total	Phase 2 (F)	Phase 2 (L)	Phase 2 Total	Total
1. Design	21	16	37	21	16	37	74
2. Supervision	22	51	73	20	57	77	150
3. Soft component services *1	19	203	222	14	208	222	444
Total	**62**	**270**	**332**	**55**	**281**	**336**	**668**

Note: (F): Foreign expert
(L): Local expert and staff, including field officers
*1: Field officers (L) make up a large proportion of the above personnel quantities; i.e. 123 M/M in Phase 1 and 132 M/M in Phase 2.

A team leader will manage the overall services of the consultants at each step of Phase 1 and Phase 2. A design engineer, a design/supervision engineer and a community specialist, all foreign experts, will be in charge of overall design, supervision, and soft component services respectively, under the team leader.

The soft component services are composed of health and hygiene education, community development and PDAM capacity building. The health and hygiene education and the community development will be conducted before and during construction. The PDAM capacity building will be conducted during construction. The education and extension works before construction is called social preparation.

Proposed consultant's setups in the case of Plan 1 development are shown in Figure A11-7.1 (Plan 1) and Figure A11-7.2 (Plan 1) for Phase 1 and Phase 2, respectively.

Proposed consultant's setups in the case of Plan 2 development are shown in Figure A11-7.3 (Plan 2) and Figure A11-7.4 (Plan 2) for Phase 1 and Phase 2, respectively.

Proposed assignment schedule of consultant personnel in the case of Plan 1 development is shown in Table A11-7.1 (Plan 1).

Proposed assignment schedule of consultant personnel in the case of Plan 2 development is shown in Table A11-7.2 (Plan 2).

Table A11-3.1 Scope of Works (1/2)

Island	Serial No.	JICA #	Name of village	Design conditions					Pumping, transmission and distribution mains[*2]					Storage, reservoir and BPTs[*3]	
				Design pop.	Served area	Topo. gradient	Annual rainfall	Source[*1]	150mm	100mm	75mm	50mm	Total	Number	Total capacity
				(Nr.)	(ha)	(1/i)	(mm)		(m)	(m)	(m)	(m)	(m)	(Nr.)	(m3)
NTB															
Lombok	1/	NTB 1.	Kuranji	1,894	28	400	1,725	E	-	-	360	-	360	-	-
	2/	NTB 2.	Bajur	6,130	25	400	1,725	E	-	580	-	-	580	-	-
	3/	NTB 3.	Sembung	2,225	16	100	1,725	E	-	-	500	-	500	-	-
	4/	NTB 4a.	Duman, upper	3,078	26	15	1,725	Sp	-	-	1,650	1,530	3,180	6	47
	5/	NTB 4b.	Duman, lower	1,926	48	60	1,725	E	-	1,900	-	-	1,900	-	-
	6/	NTB 10.	Bagik Papan	3,182	19	50	1,624	E (Sp)	-	-	2,435	-	2,435	1	30
	7/	NTB 11.	Selaparang	3,433	15	50	1,624	E (Sp)	800	1,240	2,500	-	4,540	2	84
Sumbawa	8/	NTB 13.	Lb. Mapin	3,570	29	200	1,145	Sp	-	-	-	-	-	-	-
	9/	NTB 14.	Lb. Lalar	3,136	42	200	1,145	TW	-	2,800	-	-	2,800	1	40
	10/	NTB 16.	Piong	1,662	19	100	890	TW	-	-	590	-	590	1	20
	11/	NTB 18a.	Kawuwu, lower	414	5	20	890	SW	-	-	-	890	890	-	-
	12/	NTB 18b.	Kawuwu, upper	404	6	8	890	E (Sp)		-	100	100	200	-	-
		Sub-total for Phase 1		31,054	278				800	6,520	8,135	2,520	17,975	11	221
NTT															
Flores	13/	NTT 6.	Sinar Hading	1,294	10	10	922	NTT 7.	-	-	-	-	-	1	20
	14/	NTT 7.	Ile Padung	1,122	10	8	922	Sp	-	3,500	1,340	-	4,840	3	17
Sumba	15/	NTT 18.	Weerame	1,616	45	35	676	Cv	-	-	550	-	550	1	26
	16/	NTT 19.	Kondamara	1,828	306	400	676	E (Sp)	-	-	2,975	4,025	7,000	-	-
Rote	17/	NTT 21.	Oebau	632	8	60	1,282	Cv	-	-	1,080	-	1,080	2	8
	18/	NTT 23.	Nusakdale	450	16	30	1,282	Sp	-	-	-	1,500	1,500	-	-
Timor	19/	NTT 24.	Tarus	3,977	95	200	1,282	E (Sp)	-	3,700	100	-	3,800	2	70
		Sub-total for Phase 2		10,919	490				-	7,200	6,045	5,525	18,770	9	141
	Total of Phase 1 and Phase 2			**41,973**	**768**				**800**	**13,720**	**14,180**	**8,045**	**36,745**	**20**	**362**

Note:
*1: E: existing water supply sytem; Sp: spring; E(Sp): existing system having spring source; TW: tube well; SW: shallow well; Cv: cavern water.
*2: About 80% of "Pumping, transmission and distribution mains" will be uPVC, the other 20% GS.
*3: BPT: break pressure tank

Table A11-3.1 Scope of Works (2/2)

Island	Serial No.	JICA #	Name of village	Distribution network: Public hyd-rant (Nr.)	Public taps (Nr.)	House connec-tions (Nr.)	Service pipelines*4: 75mm (m)	50mm (m)	25mm (m)	Total (m)	Service meter (Nr.)	Stream/ river crossings: L>15m (Nr.)	L<15m (Nr.)	Total of pipeline (m)
NTB														
Lombok	1/	NTB 1.	Kuranji	17	10	114	1,560	1,380	2,720	5,660	141	-	2	6,020
	2/	NTB 2.	Bajur	35	15	490	440	2,403	10,650	13,493	540	-	5	14,073
	3/	NTB 3.	Sembung	17	10	134	1,250	1,140	3,120	5,510	161	-	2	6,010
	4/	NTB 4a.	Duman, upper	33	10	123	-	1,670	5,970	7,640	-	-	1	10,820
	5/	NTB 4b.	Duman, lower	18	10	116	2,110	2,700	2,780	7,590	144	2	2	9,490
	6/	NTB 10.	Bagik Papan	30	5	127	-	3,175	3,190	6,365	-	1	-	8,800
	7/	NTB 11.	Selaparang	15	10	549	420	1,820	11,380	13,620	574	1	-	18,160
Sumbawa	8/	NTB 13.	Lb. Mapin	7	-	446	-	1,810	8,460	10,270	454	-	-	10,270
	9/	NTB 14.	Lb. Lalar	24	5	188	1,350	2,720	4,290	8,360	-	2	3	11,160
	10/	NTB 16.	Piong	13	5	133	-	3,270	2,970	6,240	-	-	-	6,830
	11/	NTB 18a.	Kawuwu, lower	3	2	17	-	-	480	480	-	-	-	1,370
	12/	NTB 18b.	Kawuwu, upper	3	-	-	-	-	100	100	-	-	-	300
		Sub-total for Phase 1		215	82	2,437	7,130	22,088	56,110	85,328	2,014	6	15	103,303
NTT														
Flores	13/	NTT 6.	Sinar Hading	5	10	207	-	3,150	4,340	7,490	222	-	-	7,490
	14/	NTT 7.	Ile Padung	7	-	180	-	2,850	3,890	6,740	202	-	-	11,580
Sumba	15/	NTT 18.	Weerame	8	10	259	420	2,330	5,440	8,190	-	-	-	8,740
	16/	NTT 19.	Kondamara	15	20	73	-	-	1,960	1,960	-	-	4	8,960
Rote	17/	NTT 21.	Oebau	10	10	13	-	4,950	560	5,510	-	2	-	6,590
	18/	NTT 23.	Nusakdale	6	10	9	-	1,000	400	1,400	-	-	3	2,900
Timor	19/	NTT 24.	Tarus	13	10	636	1,100	5,600	13,080	19,780	659	1	-	23,580
		Sub-total for Phase 2		64	70	1,377	1,520	19,880	29,670	51,070	1,083	3	7	69,840
	Total of Phase 1 and Phase 2			**279**	**152**	**3,814**	**8,650**	**41,968**	**85,780**	**136,398**	**3,097**	**9**	**22**	**173,143**

Note: *4: Service pipeline having the 75mm and 50mm diameter are of uPVC, 25mm of GS.

Table A11-4.1 Natural and Social Condition of Proposed Villages for Works

Province	Island	Number (JICA #)	Name of village	Population		Area		Topographic gradient		Annual precipitation		Dry season	Freighter port		Ferry port	
				Total	Proposed	Total	Proposed			Rainfall	Observatory		Port	Distance	Port	Distance
						(ha)	(ha)	(1/i)		(mm)				(km)		(km)
NTB	Lombok	1.	Kuranji	4,960	2,480	600	40	400	Flat	1,725	Gunungsari	Feb.-Jul.	Lember	29	Lember	29
		2.	Bajur	5,970	3,000	320	30	400	Flat	1,725	Gunungsari	Feb.-Jul.	Lember	29	Lember	29
		3.	Sembung	2,820	1,860	164	60	100	Flat	1,725	Gunungsari	Feb.-Jul.	Lember	30	Lember	30
		4. (a)	Duman	1,760	1,300	550	18	15	Steep	1,725	Gunungsari	Feb.-Jul.	Lember	30	Lember	30
		4. (b)		2,720	2,000	850	32	60	Gentle	1,725	Gunungsari	Feb.-Jul.	Lember	30	Lember	30
		10.	Bagik Papan	8,940	1,600	900	24	50	Gentle	1,624	Selaparang	Apr.-Nov.	Lember	68	Lember	68
		11.	Selaparang	3,570	1,520	800	50	50	Gentle	1,624	Selaparang	Apr.-Nov.	Lember	68	Lember	68
	Sumbawa	13.	Lb. Mapin	5,020	3,500	2,369	46	200	Flat	1,145	Sumbawa Besar	Jul.-Sep.	Bima	256	Badas	69
		14.	Lb. Lalar	3,410	2,280	3,079	27	200	Flat	1,145	Sumbawa Besar	Apr.-Oct.	Bima	326	Badas	139
		16.	Piong	1,750	1,750	36,600	34	100	Flat	890	Bima	Apr.-Oct.	Bima	114	Bima	114
		18. (a)	Kawuwu	450	450	662	15	20	Steep	890	Bima	May-Dec.	Bima	40	Bima	40
		18. (b)		450	450	662	15	8	Steep	890	Bima	May-Dec.	Bima	43	Bima	43
		Sub-total of NTB		41,820	22,190	47,556	391									
NTT	Flores	6.	Sinar Hading	1,250	1,000	1,922	32	10	Steep	922	Konga	May-Nov.	Larantuka	25	Larantuka	25
		7.	Ile Padung	1,130	1,000	2,235	27	8	Steep	922	Konga	Aug.-Nov.	Larantuka	28	Larantuka	28
	Sumba	18.	Weerame	2,290	1,500	1,026	18	35	Gentle	676	Maliru	May-Sep.	Waingapu	24	Waingapu	24
		19.	Kondamara	1,600	1,000	3,120	31	400	Flat	676	Maliru	May-Nov.	Waingapu	72	Waingapu	72
	Rote	21.	Oebao	940	500	2,800	14	60	Gentle	1,282	Tarus 010 Kup	May-Nov	Pantai Baru	42	Pantai Baru	42
		23.	Nusakdale	840	150	769	10	30	Gentle	1,282	Tarus 010 Kup	Apr.-Nov.	Pantai Baru	47	Pantai Baru	47
	Timor	24.	Tarus	6,210		1,019	200	200	Flat	1,282	Tarus 010 Kup	May-Nov	Kupan	21	Kupan	21
		Sub-total of NTT		14,260	5,150	12,891	332									
	Total for NTB and NTT			**56,080**	**27,340**	**60,447**	**723**									

Note:
- "proposed" of the "Population" and "Area" columns means 'proposed to be served with water supply at present'.
- "Dry season" shows the period of dry season heard from the villagers.
- Topographic gradient is classified "Steep" (1/i< about 30), "Gentle" (1/i< about 100), and "Flat" (about 100≤ 1/i).
- The ferry port, Badas, is a port of Labuhan Sumbawa located near Sumbawa Besar.
  Another ferry port, Labuhan Tano, is also usable for the works at Labuhan Mapin and Labuhan Lalar, that is connected to the Labuhan Lombok port.

Table A11-4.2 Monthly Precipitation (1/2)

Observatory : Gunung Sari, Lombok, NTB (Unit: mm)

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1991	314	712	29	84	130	0	87	0	6	44	350	192	1,948
1992	164	354	225	260	36	4	5	2	110	476	239	213	2,087
1993	177	206	212	104	30	99	7	12	25	216	387	308	1,783
1994	242	290	645	289	0	13	0	12	4	53	210	205	1,963
1995	204	266	316	181	85	62	16	0	5	40	372	320	1,868
1996	135	231	247	60	90	63	20	20	30	450	330	323	1,999
1997	180	360	10	131	23	10	13	0	0	0	142	168	1,037
1998	98	12	65	83	761	127	608	4	41	562	74	110	2,544
1999	117	171	177	111	34	33	85	25	55	164	189	161	1,320
2000	105	0	206	92	102	50	4	0	17	82	162	7	827
Mean	174	260	213	139	129	46	84	8	29	209	245	201	1,738

Observatory : Selaparang, Lombok, NTB (Unit: mm)

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1991	298	778	89	89	138	0	44	0	1	51	201	138	1,827
1992	220	292	194	293	11	23	13	6	60	433	134	182	1,861
1993	137	231	209	113	87	94	6	6	14	135	269	272	1,573
1994	207	183	309	246	11	1	1	1	2	20	118	170	1,269
1995	154	249	263	136	82	72	17	0	0	268	343	8	1,592
Mean	203	347	213	175	66	38	16	3	15	181	213	154	1,624

Observatory : Sumbawa Besar, Sumbawa, NTB (Unit: mm)

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1991	183	386	77	146	0	0	13	0	0	0	171	87	1,063
1992	331	347	291	185	53	1	1	1	17	60	84	129	1,500
1993	251	234	167	70	8	23	0	0	0	45	93	219	1,110
1994	201	175	26	26	5	0	0	0	0	0	74	399	906
Mean	242	286	140	107	17	6	4	0	4	26	106	209	1,145

Observatory : Bima,Sumbawa, NTB (Unit: mm)

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1991	321	171	71	3	0	0	3	3	0	0	129	101	802
1992	234	237	84	46	11	1	6	1	10	52	199	179	1,060
1993	118	123	134	63	10	32	0	0	1	6	75	194	756
1994	355	95	257	35	0	0	0	0	0	4	59	137	942
Mean	257	157	137	37	5	8	2	1	3	16	116	153	890

Table A11-4.2 Monthly Precipitation (2/2)

Observatory : Turus 010 KUP, Timor, NTT (Unit: mm)

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1980	425	532	24	37	0	0	0	0	0	5	111	88	1,222
1981	685	533	172	0	57	15	0	0	0	1	297	296	2,055
1982	236	427	207	52	4	4	4	1	0	0	33	81	1,048
1983	213	428	245	217	2	1	0	0	0	0	121	53	1,278
1984	475	318	0	6	9	2	0	0	1	4	120	0	935
1985	104	152	88	67	0	11	0	0	0	0	96	107	622
1986	550	261	67	3	4	14	71	3	6	0	83	120	1,179
1987	795	252	62	14	34	1	9	0	0	0	62	238	1,465
1988	337	333	243	19	0	0	0	2	20	4	272	289	1,518
1989	237	176	330	82	27	42	17	0	0	6	43	117	1,075
1990	302	286	233	19	5	0	0	0	0	0	28	331	1,202
1991	467	341	30	87	1	24	1	0	11	0	231	85	1,276
1992	185	364	43	182	27	0	0	7	11	17	54	121	1,010
1993	513	299	204	28	11	24	1	0	0	10	11	251	1,351
1994	260	434	216	176	0	0	0	0	0	0	38	208	1,332
1995	608	646	88	57	18	18	0	0	1	18	69	428	1,951
Mean	399	361	141	65	12	10	6	1	3	4	104	176	1,282

Observatory : Maliru, Sumba, NTT (Unit: mm)

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1997	0	0	0	120	13	19	0	2	0	0	2	216	372
1998	216	46	118	140	16	0	6	0	20	22	134	262	980
Mean	108	23	59	130	15	10	3	1	10	11	68	239	676

Observatory : Konga, Flores, NTT (Unit: mm)

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1997	211	130	0	165	0	95	0	0	0	6	145	63	814
1998	124	141	43	54	0	27	0	72	5	14	131	419	1,030
Mean	167	136	22	109	0	61	0	36	2	10	138	241	922

Table A11-4.3 Sunday and National Holiday in Indonesia in 2002

Date			Sunday and National Holiday
January	1	Tuesday	New Year's Day
	6	Sunday	
	13	Sunday	
	20	Sunday	
	27	Sunday	
February	3	Sunday	
	10	Sunday	
	12	Tuesday	Chinese Lunar Year2553(facultative holiday)
	17	Sunday	
	23	Saturday	Id'ul Adh(Dzulhijjah 10, 1422H)
	24	Sunday	
March	3	Sunday	
	10	Sunday	
	15	Friday	Hijriyah New Year(Muharram 1, 1423H)
	17	Sunday	
	24	Sunday	
	29	Friday	Good Friday
	31	Sunday	
April	7	Sunday	
	13	Saturday	Hindu Day of Quiet(Caka New Year 1924)
	14	Sunday	
	21	Sunday	
	28	Sunday	
May	5	Sunday	
	9	Thursday	Ascension Day
	12	Sunday	
	19	Sunday	
	25	Saturday	Birthday of Prophet Muhammad SAW
	26	Sunday	Buddhist Waicak Day
June	2	Sunday	
	9	Sunday	
	16	Sunday	
	23	Sunday	
	30	Sunday	
July	7	Sunday	
	14	Sunday	
	21	Sunday	
	28	Sunday	
August	4	Sunday	
	11	Sunday	
	17	Saturday	Independence Day
	18	Sunday	
	25	Sunday	
September	1	Sunday	
	8	Sunday	
	15	Sunday	
	22	Sunday	
	29	Sunday	
Octorber	4	Friday	Ascension of Prophet Muhammad SAW
	6	Sunday	
	13	Sunday	
	20	Sunday	
	27	Sunday	
Novenber	3	Sunday	
	10	Sunday	
	17	Sunday	
	24	Sunday	
December	1	Sunday	
	6	Friday	Id'ul Fitr(Syawal 1, 1423H)
	7	Saturday	Id'ul Fitr(Syawal 2, 1423H)
	8	Sunday	
	15	Sunday	
	22	Sunday	
	25	Wednesday	First Day Christmas
	29	Sunday	

Remarks : This data is based on Decree of Minister of Religious Affairs No.383/2001.

Table A11-4.4 Estimate of Workable Days (1/3)

(Unit: day)

Day	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
Lombok Barat (Observatory : Gunung Sari, Lombok, NTB)													
Earthworks													
Workable days	22.8	17.0	19.6	22.5	23.7	24.3	26.1	26.0	24.4	23.0	21.0	19.2	269.6
Workable days, rounded off	**23**	**17**	**20**	**23**	**24**	**24**	**26**	**26**	**24**	**23**	**21**	**19**	**270**
Work suspension days													
Sunday	4.0	4.0	5.0	4.0	4.0	5.0	4.0	4.0	5.0	4.0	4.0	5.0	52.0
Holiday	1.0	2.0	2.0	1.0	2.0	0.0	0.0	1.0	0.0	1.0	0.0	3.0	13.0
Rainfall	4.0	6.2	5.5	3.1	1.8	0.9	1.1	0.2	0.7	3.7	5.9	4.9	37.6
Overrap	0.7	1.2	1.1	0.6	0.5	0.1	0.2	0.2	0.1	0.7	0.8	1.1	7.2
Total	8.2	11.0	11.4	7.5	7.3	5.7	4.9	5.0	5.6	8.0	9.0	11.8	95.4
Concreteworks													
Workable days	24.3	18.9	21.0	23.8	24.5	24.6	26.4	26.1	24.7	24.3	23.1	21.0	282.8
Workable days, rounded off	**24**	**19**	**21**	**24**	**25**	**25**	**26**	**26**	**25**	**24**	**23**	**21**	**283**
Work suspension days													
Sunday	4.0	4.0	5.0	4.0	4.0	5.0	4.0	4.0	5.0	4.0	4.0	5.0	52.0
Holiday	1.0	2.0	2.0	1.0	2.0	0.0	0.0	1.0	0.0	1.0	0.0	3.0	13.0
Rainfall	2.2	3.9	3.8	1.6	0.9	0.5	0.7	0.0	0.3	2.1	3.4	2.8	22.2
Overrap	0.5	0.8	0.8	0.4	0.4	0.1	0.1	0.1	0.0	0.4	0.5	0.8	5.0
Total	6.7	9.1	10.0	6.2	6.5	5.4	4.6	4.9	5.3	6.7	6.9	10.0	82.2
Lombok Timur (Observatory : Selaparang, Lombok, NTB)													
Earthworks													
Workable days	21.943	15.257	19.229	21.714	24.171	24.057	26.743	26.143	24.571	23.229	21.457	19.829	268.34
Workable days, rounded off	**22**	**15**	**19**	**22**	**24**	**24**	**27**	**26**	**25**	**23**	**21**	**20**	**268**
Work suspension days													
Sunday	4	4	5	4	4	5	4	4	5	4	4	5	52
Holiday	1	2	2	1	2	0	0	1	0	1	0	3	13
Rainfall	4.9	8.2	5.9	4	1.3	1.1	0.3	0	0.5	3.4	5.3	4.2	39.1
Overrap	0.8429	1.4571	1.1286	0.7143	0.4714	0.1571	0.0429	0.1429	0.0714	0.6286	0.7571	1.0286	7.4429
Total	9.0571	12.743	11.771	8.2857	6.8286	5.9429	4.2571	4.8571	5.4286	7.7714	8.5429	11.171	96.657
Concreteworks													
Workable days	23.914	17.314	21.371	23.086	24.6	24.486	26.829	26.143	24.829	24.086	23.086	20.857	280.6
Workable days, rounded off	**24**	**17**	**21**	**23**	**25**	**24**	**27**	**26**	**25**	**24**	**23**	**21**	**280**
Work suspension days													
Sunday	4	4	5	4	4	5	4	4	5	4	4	5	52
Holiday	1	2	2	1	2	0	0	1	0	1	0	3	13
Rainfall	2.6	5.8	3.4	2.4	0.8	0.6	0.2	0	0.2	2.4	3.4	3	24.8
Overrap	0.5143	1.1143	0.7714	0.4857	0.4	0.0857	0.0286	0.1429	0.0286	0.4857	0.4857	0.8571	5.4
Total	7.0857	10.686	9.6286	6.9143	6.4	5.5143	4.1714	4.8571	5.1714	6.9143	6.9143	10.143	84.4
Sumbawa Besar (Observatory : Sumbawa Besar, Sumbawa, NTB)													
Earthworks													
Workable days	20.893	15.964	21.714	22.464	24.964	24.786	26.893	26.143	24.893	25.5	23.75	19.357	277.32
Workable days, rounded off	**21**	**16**	**22**	**22**	**25**	**25**	**27**	**26**	**25**	**26**	**24**	**19**	**278**
Work suspension days													
Sunday	4	4	5	4	4	5	4	4	5	4	4	5	52
Holiday	1	2	2	1	2	0	0	1	0	1	0	3	13
Rainfall	6.125	7.375	3	3.125	0.375	0.25	0.125	0	0.125	0.75	2.625	4.75	28.625
Overrap	1.0179	1.3393	0.7143	0.5893	0.3393	0.0357	0.0179	0.1429	0.0179	0.25	0.375	1.1071	5.9464
Total	10.107	12.036	9.2857	7.5357	6.0357	5.2143	4.1071	4.8571	5.1071	5.5	6.25	11.643	87.679
Concreteworks													
Workable days	23.357	18.429	22.571	23.214	25.071	24.786	27	26.143	25	25.5	24.5	20.643	286.21
Workable days, rounded off	**23**	**18**	**23**	**23**	**25**	**25**	**27**	**26**	**25**	**26**	**25**	**21**	**287**

Table A11-4.4 Estimate of Workable Days (2/3)

(Unit: day)

Day	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
Work suspension days													
Sunday	4	4	5	4	4	5	4	4	5	4	4	5	52
Holiday	1	2	2	1	2	0	0	1	0	1	0	3	13
Rainfall	3.25	4.5	2	2.25	0.25	0.25	0	0	0	0.75	1.75	3.25	18.25
Overrap	0.6071	0.9286	0.5714	0.4643	0.3214	0.0357	0	0.1429	0	0.25	0.25	0.8929	4.4643
Total	7.6429	9.5714	8.4286	6.7857	5.9286	5.2143	4	4.8571	5	5.5	5.5	10.357	78.786
Observatory : Bima,Sumbawa, NTB													
Earthworks													
Workable days	20.357	19.714	21.5	24.393	25.286	24.893	27	26.143	25	25.929	23.536	19.679	283.43
Workable days, rounded off	**20**	**20**	**22**	**24**	**25**	**25**	**27**	**26**	**25**	**26**	**24**	**20**	**284**
Work suspension days													
Sunday	4	4	5	4	4	5	4	4	5	4	4	5	52
Holiday	1	2	2	1	2	0	0	1	0	1	0	3	13
Rainfall	6.75	3	3.25	0.875	0	0.125	0	0	0	0.25	2.875	4.375	21.5
Overrap	1.1071	0.7143	0.75	0.2679	0.2857	0.0179	0	0.1429	0	0.1786	0.4107	1.0536	4.9286
Total	10.643	8.2857	9.5	5.6071	5.7143	5.1071	4	4.8571	5	5.0714	6.4643	11.321	81.571
Concreteworks													
Workable days	22.714	21	22.143	24.5	25.286	25	27	26.143	25	26.143	24.714	21.286	290.93
Workable days, rounded off	**23**	**21**	**22**	**25**	**25**	**25**	**27**	**26**	**25**	**26**	**25**	**21**	**291**
Work suspension days													
Sunday	4	4	5	4	4	5	4	4	5	4	4	5	52
Holiday	1	2	2	1	2	0	0	1	0	1	0	3	13
Rainfall	4	1.5	2.5	0.75	0	0	0	0	0	0	1.5	2.5	12.75
Overrap	0.7143	0.5	0.6429	0.25	0.2857	0	0	0.1429	0	0.1429	0.2143	0.7857	3.6786
Total	8.2857	7	8.8571	5.5	5.7143	5	4	4.8571	5	4.8571	5.2857	9.7143	74.071
Timor Barat (Observatory : Turus 010 KUP, Timor, NTT)													
Earthworks													
Workable days	17.866	14.464	21.125	23.938	25.045	24.813	26.839	26.143	24.973	26.089	23.616	19.679	274.59
Workable days, rounded off	**18**	**14**	**21**	**24**	**25**	**25**	**27**	**26**	**25**	**26**	**24**	**20**	**275**
Work suspension days													
Sunday	4	4	5	4	4	5	4	4	5	4	4	5	52
Holiday	1	2	2	1	2	0	0	1	0	1	0	3	13
Rainfall	9.6563	9.125	3.6875	1.4063	0.2813	0.2188	0.1875	0	0.0313	0.0625	2.7813	4.375	31.813
Overrap	1.5223	1.5893	0.8125	0.3438	0.3259	0.0313	0.0268	0.1429	0.0045	0.1518	0.3973	1.0536	6.4018
Total	13.134	13.536	9.875	6.0625	5.9554	5.1875	4.1607	4.8571	5.0268	4.9107	6.3839	11.321	90.411
Concreteworks													
Workable days	20.571	17.25	22.304	24.5	25.125	24.946	26.946	26.143	25	26.143	24.661	20.804	284.39
Workable days, rounded off	**21**	**17**	**22**	**25**	**25**	**25**	**27**	**26**	**25**	**26**	**25**	**21**	**285**
Work suspension days													
Sunday	4	4	5	4	4	5	4	4	5	4	4	5	52
Holiday	1	2	2	1	2	0	0	1	0	1	0	3	13
Rainfall	6.5	5.875	2.3125	0.75	0.1875	0.0625	0.0625	0	0	0	1.5625	3.0625	20.375
Overrap	1.0714	1.125	0.6161	0.25	0.3125	0.0089	0.0089	0.1429	0	0.1429	0.2232	0.8661	4.7679
Total	10.429	10.75	8.6964	5.5	5.875	5.0536	4.0536	4.8571	5	4.8571	5.3393	10.196	80.607
Sumbawa Barat (Observatory : Maliru, Sumba, NTT)													
Earthworks													
Workable days	23.571	22.286	22.786	21.929	24.857	24.786	27	26.143	24.786	25.929	24.286	17.214	285.57
Workable days, rounded off	**24**	**22**	**23**	**22**	**25**	**25**	**27**	**26**	**25**	**26**	**24**	**17**	**286**
Work suspension days													
Sunday	4	4	5	4	4	5	4	4	5	4	4	5	52
Holiday	1	2	2	1	2	0	0	1	0	1	0	3	13

Table A11-4.4 Estimate of Workable Days (3/3)

(Unit: day)

Day	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
Rainfall	3	0	1.75	3.75	0.5	0.25	0	0	0.25	0.25	2	7.25	19
Overrap	0.5714	0.2857	0.5357	0.6786	0.3571	0.0357	0	0.1429	0.0357	0.1786	0.2857	1.4643	4.5714
Total	7.4286	5.7143	8.2143	8.0714	6.1429	5.2143	4	4.8571	5.2143	5.0714	5.7143	13.786	79.429
Concreteworks													
Workable days	24.429	22.286	23.857	23	25.286	25	27	26.143	25	26.143	25.143	19.143	292.43
Workable days, rounded off	**24**	**22**	**24**	**23**	**25**	**25**	**27**	**26**	**25**	**26**	**25**	**19**	**291**
Work suspension days													
Sunday	4	4	5	4	4	5	4	4	5	4	4	5	52
Holiday	1	2	2	1	2	0	0	1	0	1	0	3	13
Rainfall	2	0	0.5	2.5	0	0	0	0	0	0	1	5	11
Overrap	0.4286	0.2857	0.3571	0.5	0.2857	0	0	0.1429	0	0.1429	0.1429	1.1429	3.4286
Total	6.5714	5.7143	7.1429	7	5.7143	5	4	4.8571	5	4.8571	4.8571	11.857	72.571
Flores Timur (Observatory : Konga, Flores, NTT)													
Earthworks													
Workable days	22.5	18.429	23.857	23	25.286	23.714	27	25.071	25	25.929	23.214	18.071	281.07
Workable days, rounded off	**23**	**18**	**24**	**23**	**25**	**24**	**27**	**25**	**25**	**26**	**23**	**18**	**281**
Work suspension days													
Sunday	4	4	5	4	4	5	4	4	5	4	4	5	52
Holiday	1	2	2	1	2	0	0	1	0	1	0	3	13
Rainfall	4.25	4.5	0.5	2.5	0	1.5	0	1.25	0	0.25	3.25	6.25	24.25
Overrap	0.75	0.9286	0.3571	0.5	0.2857	0.2143	0	0.3214	0	0.1786	0.4643	1.3214	5.3214
Total	8.5	9.5714	7.1429	7	5.7143	6.2857	4	5.9286	5	5.0714	6.7857	12.929	83.929
Concreteworks													
Workable days	24	19.286	23.857	24.286	25.286	24.143	27	25.286	25	26.143	24.714	20	289
Workable days, rounded off	**24**	**19**	**24**	**24**	**25**	**24**	**27**	**25**	**25**	**26**	**25**	**20**	**288**
Work suspension days													
Sunday	4	4	5	4	4	5	4	4	5	4	4	5	52
Holiday	1	2	2	1	2	0	0	1	0	1	0	3	13
Rainfall	2.5	3.5	0.5	1	0	1	0	1	0	0	1.5	4	15
Overrap	0.5	0.7857	0.3571	0.2857	0.2857	0.1429	0	0.2857	0	0.1429	0.2143	1	4
Total	7	8.7143	7.1429	5.7143	5.7143	5.8571	4	5.7143	5	4.8571	5.2857	11	76

Table A11-4.5 Production Rate of Major Construction Equipment (1/2)

Backhoe **excavation, (including loading)**

Q= 3,600 x q x k x f x E / Cm

Where,
- Q: Hourly production (m3/hr)
- q: Moldboard capacity, struck (m3)
- k: Coefficient of bucket
- E: Job-management factor
- f: Soil conversion factor
- Cm: Cycle time (sec)

- **Backhoe, 0.35m3** **E020212**

Material	q	k	f	E	Cm	Q
(Bank measurement)						
Soil	0.35	0.80	0.833	0.65	28	19
Rock	0.35	0.60	0.625	0.65	32	10
(Embankment measurement)						
Soil	0.35	0.80	0.750	0.65	28	18
Rock	0.35	0.60	0.781	0.65	32	12
(Weight measurement, Q (t/hr))						
Aggregate, river sand	0.35	0.75	1.500	0.65	28	33
Aggregate, gravel	0.35	0.75	1.580	0.65	28	35

- **Backhoe, 0.6m3** **E020215**

Material	q	k	f	E	Cm	Q
(Bank measurement)						
Soil	0.60	0.80	0.833	0.65	28	33
Rock	0.60	0.60	0.625	0.65	32	16
(Embankment measurement)						
Soil	0.60	0.80	0.750	0.65	28	30
Rock	0.60	0.60	0.781	0.65	32	21
(Weight measurement, Q (t/hr))						
Aggregate, river sand	0.60	0.75	1.500	0.65	28	56
Aggregate, gravel	0.60	0.75	1.580	0.65	28	59

Backhoe **placing and spreading**

Q= 3,600 x q x k x f x E / Cm

Where,
- Q: Hourly production (m3/hr)
- q: Moldboard capacity, struck (m3)
- k: Coefficient of bucket
- E: Job-management factor
- f: Soil conversion factor
- Cm: Cycle time (sec)

Table A11-4.5 Production Rate of Major Construction Equipment (2/2)

- **Backhoe, 0.35m3 E020212**

Material	q	k	f	E	Cm	Q
(Bank measurement)						
Soil	0.35	0.80	0.833	0.80	24	28
Rock	0.35	0.60	0.625	0.80	24	16
(Embankment measurement)						
Soil	0.35	0.80	0.750	0.80	24	25
Rock	0.35	0.60	0.781	0.80	24	20
(Weight measurement, Q (t/hr))						
Aggregate, river sand	0.35	0.75	1.500	0.80	24	47
Aggregate, gravel	0.35	0.75	1.580	0.80	24	50

- **Backhoe, 0.6m3 E020215**

Material	q	k	f	E	Cm	Q
(Bank measurement)						
Soil	0.60	0.80	0.833	0.80	24	48
Rock	0.60	0.60	0.625	0.80	24	27
(Embankment measurement)						
Soil	0.60	0.80	0.750	0.80	24	43
Rock	0.60	0.60	0.781	0.80	24	34
(Weight measurement, Q (t/hr))						
Aggregate, river sand	0.60	0.75	1.500	0.80	24	81
Aggregate, gravel	0.60	0.75	1.580	0.80	24	85

Vibratory plate compactor, 70-80kg compaction E080712

Q= V x W x D x f x E / N

Where,
- Q: Hourly production (m3/hr)
- V: Working speed (m/hr)
- W: Effective spreading width (m)
- D: Finishing depth (m)
- f: Soil conversion factor
- E: Job-management factor
- N: Passing time (time)

Materials	D	N	V	W	D	f	E	N	Q	
(Embankment measurement)									m3/hr	m3/day
Contact clay	0.1	6	600	0.40	0.10	1.000	0.70	6	2.8	19
Others	0.2	6	600	0.40	0.20	1.000	0.70	6	5.6	38

Table A11-5.1 Progress Rate of Construction Works

Work: **Pipe laying, GS pipe, dia.= 25mm (Excavation by Manpower)**
Work section: **30 m**

No.	Work item	Unit	Q'ty	Resouce[*1]	Productivity[*2]	Resource input	Required days	Days[*3] 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
								work cycle for 30m section →																
								work cycle for 30m section →																
1.	Removal of obstruct	L.S	1	CW	1	1	1.0	1		1		1		1		1		1		1		1		1
2.	Excavation	m3	16	CW	1.2	10	2.0	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
3.	Pipe works																							
	- placement	m	30	PL	0.026	1	0.8		1		1		1		1		1		1		1		1	
		m	30	CW	0.026	2	0.4		2		2		2		2		2		2		2		2	
	- Joint	Nr.	6	PL	0.14	1	0.9	1		1		1		1		1		1		1		1		1
		Nr.	6	CW	0.16	2	0.5	2		2		2		2		2		2		2		2		2
4.	Backfilling	m3	16	CW	0.52	5	1.7	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
															CM ← →									
(Resource total)																								
Formulation of a fleet		:		**PL**		**1**	(100%)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		:		**CW**		**18**	(97%)	18	17	18	17	18	17	18	17	18	17	18	17	18	17	18	17	18
				Total		19		19	18	19	18	19	18	19	18	19	18	19	18	19	18	19	18	19
(Progress rate)[*4]																								
Pipe laying, GS pipe, dia.= 25mm (Excavation by Manpower)							CM (cycle time)																	
		m	30		**15 m/day**		2.0																	

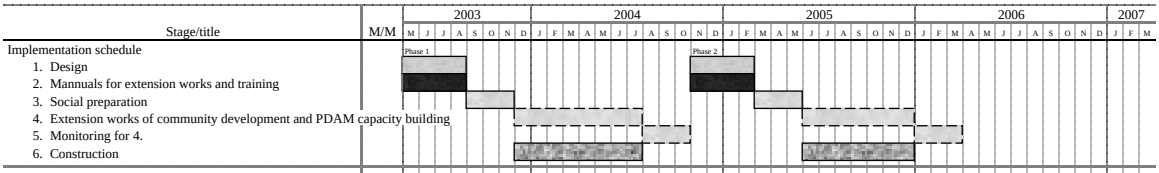
Note: *1: PL: plumber; CW: common worker
*2: "Productivity" indicates equipment-day or man-day required to execute the works of 1m3, 1m or 1Nr.
*3: "Days" are not calendar days but workable days. Numbers under day columns indicate quantities of resources to be put into.
*4: Progress rate of work by a fleet, 15m/day, is given dividing the work section (30m) by cycle time (2days).

Work: **Pipe laying, GS pipe, dia.= 25mm (Excavation by Equipment)**
Work section: **237 m**

No.	Work item	Unit	Q'ty	Resouce[*1]	Productivity[*2]	Resource input	Required days	Days[*3] 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
								work cycle for 412m section →																
								work cycle for 412m section →																
1.	Removal of obstruct	L.S	1	CW	8	8	1.0	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
2.	Excavation																							
	- excavation	m3	128	eBH	0.0078	1	1.0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	- operator			OP				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3.	Pipe works																							
	- placement	m	237	PL	0.026	7	0.9	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
		m	237	CW	0.026	7	0.9	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	- Joint	Nr.	52	PL	0.14	8	1.0	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
		Nr.	52	CW	0.16	9	1.0	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
4.	Backfilling																							
	- placing and spreadi	m3	128	eBH	0.00593	1	0.8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	- compaction	m3	128	eVC	0.02632	4	0.9	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	- operator			OP				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	- assistant			CW				4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
													CM ← →											
(Resource total)																								
Formulation of a fleet		:		**OP**		**2**	(100%)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		:		**PL**		**15**	(100%)	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
		:		**CW**		**28**	(100%)	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
		:		**eBH**		**2**	(100%)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		:		**eVC**		**4**	(100%)	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
				Total (labor)		45		45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45
				Total (equipment)		6		6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
(Progress rate)[*4]																								
Pipe laying, GS pipe, dia.= 25mm (Excavation by Equipment)							CM (cycle time)																	
		m	237		**237 m/day**		1.0																	

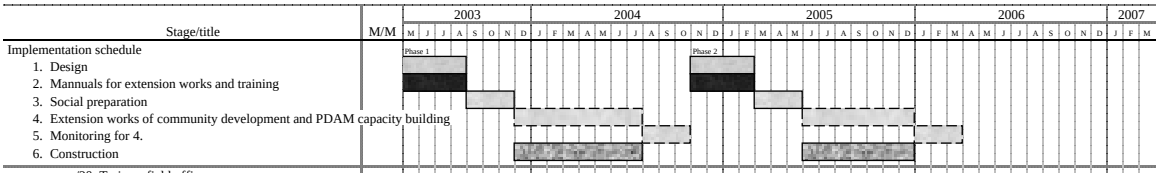
Note: *1: OP: operator; PL: plumber; CW: common worker; eBH: backhoe, 0.35m3; eVC: vibratory plate compactor, 70-80kg
*2: "Productivity" indicates equipment-day or man-day required to execute the works of 1m3, 1m or 1Nr.
*3: "Days" are not calendar days but workable days. Numbers under day columns indicate quantities of resources to be put into.
*4: Progress rate of work by a fleet, 237m/day, is given dividing the work section (237m) by cycle time (1day).

Table A11-7.1 (Plan 1) Proposed Assignment Schedule of Consultant (1/4)



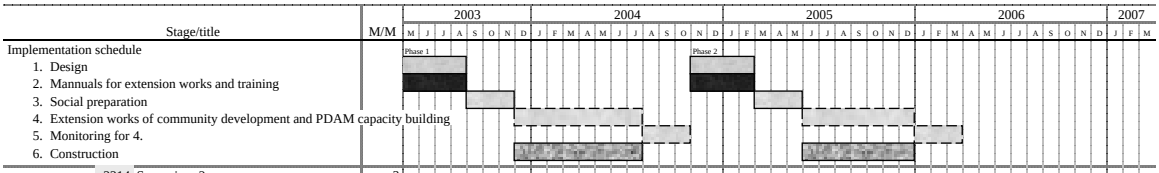
Stage/title	M/M	2003 M	J	J	A	S	O	N	D	2004 J	F	M	A	M	J	J	A	S	O	N	D	2005 J	F	M	A	M	J	J	A	S	O	N	D	2006 J	F	M	A	M	J	J	A	S	O	N	D	2007 J	F	M
Phase 1 (NTB)																																																	
[Design]																																																	
1. Design																																																	
1010 Team leader	4	1	1	1	1																																											
1110 Hydro-geologist	2	1	1																																													
1120 Geodetic engineer	3	1	1	1																																											
1210 Design engineer-1	3	1	1	1																																											
1220 Design engineer-2	3	1	1	1																																											
1222 Design engineers (L)	6	2	2	2																																											
1224 CAD operators (L)	6	2	2	2																																											
1412 Secretary/KBO	4	1	1	1	1																																										
2. Preparation of procurement documents																																																
1310 Cost estimator	3		1	1	1																																											
1320 Specification specialist	3		1	1	1																																											
Total for [Design]																																																
1010 Team leader	4	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1110 Hydro-geologist	2	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1120 Geodetic engineer	3	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1210 Design engineer-1	3	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1220 Design engineer-2	3	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1222 Design engineers (L)	6	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1224 CAD operators (L)	6	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1310 Cost estimator	3	-	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1320 Specification specialist	3	-	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1412 Secretary/KBO	4	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total for [Design] in Phase 1 (NTB)	**37**	**10**	**12**	**11**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
[Supervision]																																															
1. Supervision																																															
1010 Team leader	8									1	1	1	1	1	1	1	1																															
2110 Design/supervision engineer-1	8									1	1	1	1	1	1	1	1																															
2120 Design/supervision engineer-2	3														1	1	1																														
2122 Pipe engineer-1	8									1	1	1	1	1	1	1	1																															
2124 Pipe engineer-2	3														1	1	1																														
2126 Pipe engineer-3	3														1	1	1																														
2128 Pipe engineer-4	0																																														
2212 Supervisor-1	6										1	1	1	1	1	1	1																														
2214 Supervisor-2	3														1	1	1																														
2216 Supervisor-3	3														1	1	1																														
2218 Supervisor-4	0																																														
2312 Surveyor	8									1	1	1	1	1	1	1	1																															
2514 Secretary/KBO	8									1	1	1	1	1	1	1	1																															
2516 Secretary	3														1	1	1																														
2516 Secretary	3														1	1	1																														
2516 Secretary	0																																														
2. Preparation of O&M manuals																																															
2410 O&M expert-1	3														1	1	1																														
2412 O&M expert-2	3														1	1	1																														
Total for [Supervision]																																															
1010 Team leader	8	-	-	-	-	-	-	-	-	1	1	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2110 Design/supervision engineer-1	8	-	-	-	-	-	-	-	-	1	1	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2120 Design/supervision engineer-2	3	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2122 Pipe engineer-1	8	-	-	-	-	-	-	-	-	1	1	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2124 Pipe engineer-2	3	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2126 Pipe engineer-3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2128 Pipe engineer-4	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2212 Supervisor-1	6	-	-	-	-	-	-	-	-	-	1	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2214 Supervisor-2	3	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2216 Supervisor-3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2218 Supervisor-4	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2312 Surveyor	8	-	-	-	-	-	-	-	-	1	1	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2410 O&M expert-1	3	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2412 O&M expert-2	3	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2514 Secretary/KBO	8	-	-	-	-	-	-	-	-	1	1	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2516 Secretary	6	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total for [Supervision] in Phase 1 (NTE	**73**	**-**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**5**	**6**	**6**	**6**	**15**	**15**	**15**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
[Soft component services]																																															
1. Overall management																																															
1010 Team leader	1																				1																										
3010 Community specialist	8				1	1	1				1	1			1	1					1																										
3712 Administrator	18	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1																										
2. Preparation of manuals, business planning, budgeting and tariff policy																																															
3010 Community specialist	3	1	1	1																																										
3110 Training specialist-1	1		1																																										
3112 Training specialist-2	1		1																																										
3212 Community development specialist	1		1																																										
3222 Community health education specialist	1		1																																										
3410 Management specialist-1	3	1	1				1																																							
3412 Management specialist-2	6	1	1	1	1	1	1																																						
3422 Finance/tariff specialist-1	6	1	1	1	1	1	1																																						
3432 Water supply planning specialist	3	1	1				1																																						
3. Training																																															
1) Employment of field officers																																															
3112 Training specialist-2	1			1																																										
3212 Community development specialist	1			1																																										
3222 Community health education specialist	1			1																																										
2) Training																																															
/10 Trainer																																															
3112 Training specialist-2	1				1																																									
3212 Community development specialist	1				1																																									
3222 Community health education specialist	1				1																																									
3312 IEC specialist	1				1																																									

Table A11-7.1 (Plan 1) Proposed Assignment Schedule of Consultant (2/4)



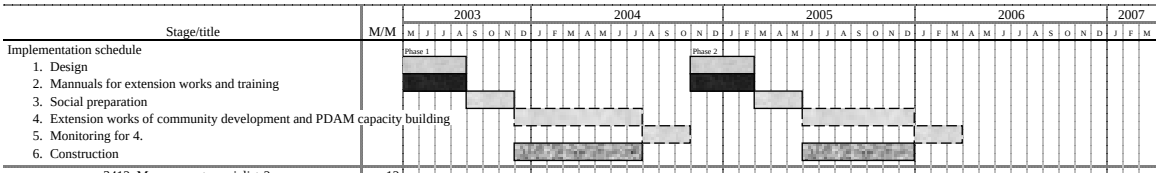
Stage/title	M/M
Implementation schedule	
1. Design	
2. Mannuals for extension works and training	
3. Social preparation	
4. Extension works of community development and PDAM capacity building	
5. Monitoring for 4.	
6. Construction	
/20 Trainee, field officer	
3512 Community field officer (CFO)	8
3514 Health field officer (HFO)	8
4. Extension	
1) Social preparation	
3112 Training specialist-2	3
3212 Community development specialist	3
3222 Community health education specialist	3
3312 IEC specialist	2
3512 Community field officer (CFO)	24
3514 Health field officer (HFO)	24
2) Community development and extension	
/10 Supervision	
3212 Community development specialist	3
3222 Community health education specialist	3
/20 Community development	
3512 Community field officer (CFO)	60
3514 Health field officer (HFO)	30
3314 Gender specialist	1
3) PDAM capacity building (incl. tariff setting)	
3410 Management specialist-1	3
3412 Management specialist-2	6
3422 Finance/tariff specialist-1	6
5. Monitoring	
3212 Community development specialist	1
3222 Community health education specialist	1
3612 Monitoring and evaluation specialist	3
3622 Participatory planning specialist	2
Total for [Soft component services]	
1010 Team leader	1
3010 Community specialist	11
3012 Chief coordinator	0
3110 Training specialist-1	1
3112 Training specialist-2	6
3212 Community development specialist	10
3222 Community health education specialist	10
3312 IEC specialist	3
3314 Gender specialist	1
3410 Management specialist-1	6
3412 Management specialist-2	12
3422 Finance/tariff specialist-1	12
3424 Finance/tariff specialist-2	0
3432 Water supply planning specialist	3
3512 Community field officer (CFO)	92
3514 Health field officer (HFO)	62
3516 Field officer (FO)	0
3612 Monitoring and evaluation specialist	3
3622 Participatory planning specialist	2
3712 Administrator	18
Total for [Soft component services] in F	**253**
Total for Phase 1 (NTB)	
Total for [Design] in Phase 1 (NTB)	37
Total for [Supervision] in Phase 1 (NTB)	73
Total for [Soft component services] in Pha	253
Total for Phase 1 (NTB)	363
Phase 2 (NTT)	
[Design]	
1. Design	
1010 Team leader	4
1110 Hydro-geologist	2
1120 Geodetic engineer	3
1210 Design engineer-1	3
1220 Design engineer-2	3
1222 Design engineers (L)	6
1224 CAD operators (L)	6
1412 Secretary/KBO	4
2. Preparation of procurement documents	
1310 Cost estimator	3
1320 Specification specialist	3
Total for [Design]	
1010 Team leader	4
1110 Hydro-geologist	2
1120 Geodetic engineer	3
1210 Design engineer-1	3
1220 Design engineer-2	3
1222 Design engineers (L)	6
1224 CAD operators (L)	6
1310 Cost estimator	3
1320 Specification specialist	3
1412 Secretary/KBO	4
Total for [Design] in Phase 2 (NTT)	**37**
[Supervision]	
1. Supervision	
1010 Team leader	7
2110 Design/supervision engineer-1	7
2120 Design/supervision engineer-2	4
2122 Pipe engineer-1	6
2124 Pipe engineer-2	3
2126 Pipe engineer-3	3
2128 Pipe engineer-4	3
2212 Supervisor-1	4

Table A11-7.1 (Plan 1) Proposed Assignment Schedule of Consultant (3/4)



Stage/title	M/M
Implementation schedule	
1. Design	
2. Mannuals for extension works and training	
3. Social preparation	
4. Extension works of community development and PDAM capacity building	
5. Monitoring for 4.	
6. Construction	
2214 Supervisor-2	3
2216 Supervisor-3	3
2218 Supervisor-4	3
2312 Surveyor	7
2514 Secretary/KBO	7
2516 Secretary	3
2516 Secretary	3
2516 Secretary	3
2. Preparation of O&M manuals	
2410 O&M expert-1	3
2412 O&M expert-2	3
Total for [Supervision]	
1010 Team leader	7
2110 Design/supervision engineer-1	7
2120 Design/supervision engineer-2	4
2122 Pipe engineer-1	6
2124 Pipe engineer-2	3
2126 Pipe engineer-3	3
2128 Pipe engineer-4	3
2212 Supervisor-1	4
2214 Supervisor-2	3
2216 Supervisor-3	3
2218 Supervisor-4	3
2312 Surveyor	7
2410 O&M expert-1	3
2412 O&M expert-2	3
2514 Secretary/KBO	7
2516 Secretary	9
Total for [Supervision] in Phase 2 (NT1	**75**
[Soft component services]	
1. Overall management	
1010 Team leader	1
3010 Community specialist	6
3712 Administrator	17
2. Preparation of manuals, business planning, budgeting and tariff policy	
3010 Community specialist	1
3212 Community development specialist	1
3222 Community health education specialist	1
3410 Management specialist-1	3
3412 Management specialist-2	6
3422 Finance/tariff specialist-1	6
3432 Water supply planning specialist	3
3. Training	
1) Employment of field officers	
3112 Training specialist-2	1
3212 Community development specialist	1
3222 Community health education specialist	1
2) Training	
/10 Trainer	
3112 Training specialist-2	1
3212 Community development specialist	1
3222 Community health education specialist	1
3312 IEC specialist	1
/20 Trainee, field officer	
3512 Community field officer (CFO)	5
3514 Health field officer (HFO)	5
4. Extension	
1) Social preparation	
3112 Training specialist-2	3
3212 Community development specialist	3
3222 Community health education specialist	3
3312 IEC specialist	2
3512 Community field officer (CFO)	15
3514 Health field officer (HFO)	15
2) Community development and extension	
/10 Supervision	
3212 Community development specialist	2
3222 Community health education specialist	2
/20 Community development	
3512 Community field officer (CFO)	34
3514 Health field officer (HFO)	21
3314 Gender specialist	1
3) PDAM capacity building (incl. tariff setting)	
3410 Management specialist-1	3
3412 Management specialist-2	6
3422 Finance/tariff specialist-1	6
5. Monitoring	
3212 Community development specialist	1
3222 Community health education specialist	1
3612 Monitoring and evaluation specialist	3
3622 Participatory planning specialist	2
Total for [Soft component services]	
1010 Team leader	1
3010 Community specialist	7
3012 Chief coordinator	0
3110 Training specialist-1	0
3112 Training specialist-2	5
3212 Community development specialist	9
3222 Community health education specialist	9
3312 IEC specialist	3
3314 Gender specialist	1
3410 Management specialist-1	6

Table A11-7.1 (Plan 1) Proposed Assignment Schedule of Consultant (4/4)



Stage/title	M/M
Implementation schedule	
1. Design	
2. Mannuals for extension works and training	
3. Social preparation	
4. Extension works of community development and PDAM capacity building	
5. Monitoring for 4.	
6. Construction	
3412 Management specialist-2	12
3422 Finance/tariff specialist-1	12
3424 Finance/tariff specialist-2	0
3432 Water supply planning specialist	3
3512 Community field officer (CFO)	54
3514 Health field officer (HFO)	41
3516 Field officer (FO)	0
3612 Monitoring and evaluation specialist	3
3622 Participatory planning specialist	2
3712 Administrator	17
Total for [Soft component services] in F	**185**
Total for Phase 2 (NTT)	
Total for [Design] in Phase 2 (NTT)	37
Total for [Supervision] in Phase 2 (NTT)	75
Total for [Soft component services] in Pha	185
Total for Phase 2 (NTT)	297
Total of Phase 1 (NTB) and Phase 2 (NTT)	
Total for Phase 1 (NTB)	363
Total for Phase 2 (NTT)	297
Total of Phase 1 (NTB) and Phase 2 (NT	**660**

Phase 1 (NTB)

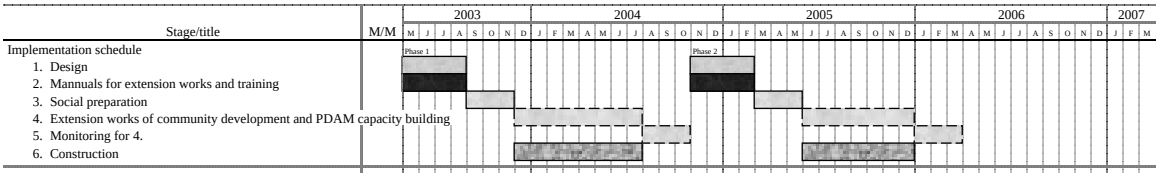
[Design]	21
	16
	37
[Supervision]	22
	51
	73
[Soft component services]	19
	234
	253
Total for Phase 1 (NTB)	62
	301
	363

Phase 2 (NTT)

[Design]	21
	16
	37
[Supervision]	21
	54
	75
[Soft component services]	14
	171
	185
Total for Phase 2 (NTT)	56
	241
	297

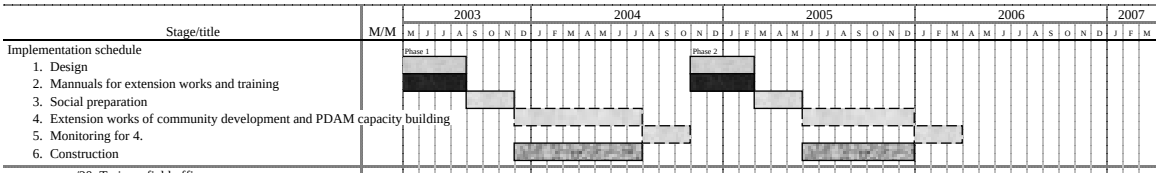
Phase 1 (NTB) + Phase 2 (NTT)	**660**

Table A11-7.2 (Plan 2) Proposed Assignment Schedule of Consultant (1/4)



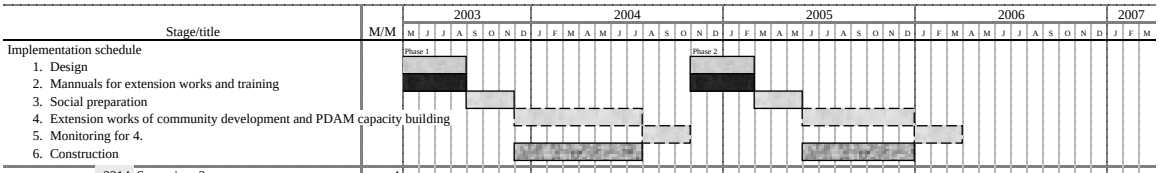
Stage/title	M/M
Phase 1	
[Design]	
1. Design	
1010 Team leader	4
1110 Hydro-geologist	2
1120 Geodetic engineer	3
1210 Design engineer-1	3
1220 Design engineer-2	3
1222 Design engineers (L)	6
1224 CAD operators (L)	6
1412 Secretary/KBO	4
2. Preparation of procurement documents	
1310 Cost estimator	3
1320 Specification specialist	3
Total for [Design]	
1010 Team leader	4
1110 Hydro-geologist	2
1120 Geodetic engineer	3
1210 Design engineer-1	3
1220 Design engineer-2	3
1222 Design engineers (L)	6
1224 CAD operators (L)	6
1310 Cost estimator	3
1320 Specification specialist	3
1412 Secretary/KBO	4
Total for [Design] in Phase 1	**37**
[Supervision]	
1. Supervision	
1010 Team leader	8
2110 Design/supervision engineer-1	8
2120 Design/supervision engineer-2	3
2122 Pipe engineer-1	8
2124 Pipe engineer-2	3
2126 Pipe engineer-3	3
2128 Pipe engineer-4	0
2212 Supervisor-1	6
2214 Supervisor-2	3
2216 Supervisor-3	3
2218 Supervisor-4	0
2312 Surveyor	8
2514 Secretary/KBO	8
2516 Secretary	3
2516 Secretary	3
2516 Secretary	0
2. Preparation of O&M manuals	
2410 O&M expert-1	3
2412 O&M expert-2	3
Total for [Supervision]	
1010 Team leader	8
2110 Design/supervision engineer-1	8
2120 Design/supervision engineer-2	3
2122 Pipe engineer-1	8
2124 Pipe engineer-2	3
2126 Pipe engineer-3	3
2128 Pipe engineer-4	0
2212 Supervisor-1	6
2214 Supervisor-2	3
2216 Supervisor-3	3
2218 Supervisor-4	0
2312 Surveyor	8
2410 O&M expert-1	3
2412 O&M expert-2	3
2514 Secretary/KBO	8
2516 Secretary	6
Total for [Supervision] in Phase 1	**73**
[Soft component services]	
1. Overall management	
1010 Team leader	1
3010 Community specialist	8
3712 Administrator	18
2. Preparation of manuals, business planning, budgeting and tariff policy	
3010 Community specialist	3
3110 Training specialist-1	1
3112 Training specialist-2	1
3212 Community development specialist	1
3222 Community health education specialist	1
3410 Management specialist-1	3
3412 Management specialist-2	6
3422 Finance/tariff specialist-1	6
3432 Water supply planning specialist	3
3. Training	
1) Employment of field officers	
3112 Training specialist-2	1
3212 Community development specialist	1
3222 Community health education specialist	1
2) Training	
/10 Trainer	
3112 Training specialist-2	1
3212 Community development specialist	1
3222 Community health education specialist	1
3312 IEC specialist	1

Table A11-7.2 (Plan 2) Proposed Assignment Schedule of Consultant (2/4)



Stage/title	M/M
Implementation schedule	
1. Design	
2. Mannuals for extension works and training	
3. Social preparation	
4. Extension works of community development and PDAM capacity building	
5. Monitoring for 4.	
6. Construction	
/20 Trainee, field officer	
3512 Community field officer (CFO)	6
3514 Health field officer (HFO)	6
4. Extension	
1) Social preparation	
3112 Training specialist-2	3
3212 Community development specialist	3
3222 Community health education specialist	3
3312 IEC specialist	2
3512 Community field officer (CFO)	18
3514 Health field officer (HFO)	18
2) Community development and extension	
/10 Supervision	
3212 Community development specialist	3
3222 Community health education specialist	3
/20 Community development	
3512 Community field officer (CFO)	45
3514 Health field officer (HFO)	30
3314 Gender specialist	1
3) PDAM capacity building (incl. tariff setting)	
3410 Management specialist-1	3
3412 Management specialist-2	6
3422 Finance/tariff specialist-1	6
5. Monitoring	
3212 Community development specialist	1
3222 Community health education specialist	1
3612 Monitoring and evaluation specialist	3
3622 Participatory planning specialist	2
Total for [Soft component services]	
1010 Team leader	1
3010 Community specialist	11
3012 Chief coordinator	0
3110 Training specialist-1	1
3112 Training specialist-2	6
3212 Community development specialist	10
3222 Community health education specialist	10
3312 IEC specialist	3
3314 Gender specialist	1
3410 Management specialist-1	6
3412 Management specialist-2	12
3422 Finance/tariff specialist-1	12
3424 Finance/tariff specialist-2	0
3432 Water supply planning specialist	3
3512 Community field officer (CFO)	69
3514 Health field officer (HFO)	54
3516 Field officer (FO)	0
3612 Monitoring and evaluation specialist	3
3622 Participatory planning specialist	2
3712 Administrator	18
Total for [Soft component services] in P	**222**
Total for Phase 1	
Total for [Design] in Phase 1	37
Total for [Supervision] in Phase 1	73
Total for [Soft component services] in Pha	222
Total for Phase 1	332
Phase 2	
[Design]	
1. Design	
1010 Team leader	4
1110 Hydro-geologist	2
1120 Geodetic engineer	3
1210 Design engineer-1	3
1220 Design engineer-2	3
1222 Design engineers (L)	6
1224 CAD operators (L)	6
1412 Secretary/KBO	4
2. Preparation of procurement documents	
1310 Cost estimator	3
1320 Specification specialist	3
Total for [Design]	
1010 Team leader	4
1110 Hydro-geologist	2
1120 Geodetic engineer	3
1210 Design engineer-1	3
1220 Design engineer-2	3
1222 Design engineers (L)	6
1224 CAD operators (L)	6
1310 Cost estimator	3
1320 Specification specialist	3
1412 Secretary/KBO	4
Total for [Design] in Phase 2	**37**
[Supervision]	
1. Supervision	
1010 Team leader	7
2110 Design/supervision engineer-1	7
2120 Design/supervision engineer-2	3
2122 Pipe engineer-1	6
2124 Pipe engineer-2	4
2126 Pipe engineer-3	3
2128 Pipe engineer-4	3
2212 Supervisor-1	4

Table A11-7.2 (Plan 2) Proposed Assignment Schedule of Consultant (3/4)



Stage/title	M/M
Implementation schedule	
1. Design	
2. Mannuals for extension works and training	
3. Social preparation	
4. Extension works of community development and PDAM capacity building	
5. Monitoring for 4.	
6. Construction	
2214 Supervisor-2	4
2216 Supervisor-3	3
2218 Supervisor-4	3
2312 Surveyor	7
2514 Secretary/KBO	7
2516 Secretary	4
2516 Secretary	3
2516 Secretary	3
2. Preparation of O&M manuals	
2410 O&M expert-1	3
2412 O&M expert-2	3
Total for [Supervision]	
1010 Team leader	7
2110 Design/supervision engineer-1	7
2120 Design/supervision engineer-2	3
2122 Pipe engineer-1	6
2124 Pipe engineer-2	4
2126 Pipe engineer-3	3
2128 Pipe engineer-4	3
2212 Supervisor-1	4
2214 Supervisor-2	4
2216 Supervisor-3	3
2218 Supervisor-4	3
2312 Surveyor	7
2410 O&M expert-1	3
2412 O&M expert-2	3
2514 Secretary/KBO	7
2516 Secretary	10
Total for [Supervision] in Phase 2	**77**
[Soft component services]	
1. Overall management	
1010 Team leader	1
3010 Community specialist	6
3712 Administrator	17
2. Preparation of manuals, business planning, budgeting and tariff policy	
3010 Community specialist	1
3212 Community development specialist	1
3222 Community health education specialist	1
3410 Management specialist-1	3
3412 Management specialist-2	6
3422 Finance/tariff specialist-1	6
3432 Water supply planning specialist	3
3. Training	
1) Employment of field officers	
3112 Training specialist-2	1
3212 Community development specialist	1
3222 Community health education specialist	1
2) Training	
/10 Trainer	
3112 Training specialist-2	1
3212 Community development specialist	1
3222 Community health education specialist	1
3312 IEC specialist	1
/20 Trainee, field officer	
3512 Community field officer (CFO)	7
3514 Health field officer (HFO)	7
4. Extension	
1) Social preparation	
3112 Training specialist-2	3
3212 Community development specialist	3
3222 Community health education specialist	3
3312 IEC specialist	2
3512 Community field officer (CFO)	21
3514 Health field officer (HFO)	21
2) Community development and extension	
/10 Supervision	
3212 Community development specialist	2
3222 Community health education specialist	2
/20 Community development	
3512 Community field officer (CFO)	47
3514 Health field officer (HFO)	29
3314 Gender specialist	1
3) PDAM capacity building (incl. tariff setting)	
3410 Management specialist-1	3
3412 Management specialist-2	6
3422 Finance/tariff specialist-1	6
5. Monitoring	
3212 Community development specialist	1
3222 Community health education specialist	1
3612 Monitoring and evaluation specialist	3
3622 Participatory planning specialist	2
Total for [Soft component services]	
1010 Team leader	1
3010 Community specialist	7
3012 Chief coordinator	0
3110 Training specialist-1	0
3112 Training specialist-2	5
3212 Community development specialist	9
3222 Community health education specialist	9
3312 IEC specialist	3
3314 Gender specialist	1
3410 Management specialist-1	6

Table A11-7.2 (Plan 2) Proposed Assignment Schedule of Consultant (4/4)

Stage/title	M/M	2003 M J J A S O N D	2004 J F M A M J J A S O N D	2005 J F M A M J J A S O N D	2006 J F M A M J J A S O N D	2007 J F M
Implementation schedule		Phase 1		Phase 2		
1. Design						
2. Mannuals for extension works and training						
3. Social preparation						
4. Extension works of community development and PDAM capacity building						
5. Monitoring for 4.						
6. Construction						
3412 Management specialist-2	12	- - - - - - -	- - - - - - - - - - - -	1 1 1 1 1 - -	1 1 1 1 1 - - - - - - - - - - - -	- - -
3422 Finance/tariff specialist-1	12	- - - - - - -	- - - - - - - - - - - -	1 1 1 1 1 - -	1 1 1 1 1 - - - - - - - - - - - -	- - -
3424 Finance/tariff specialist-2	0	- - - - - - -	- - - - - - - - - - - -	- - - - - - -	- - - - - - - - - - - - - - - - -	- - -
3432 Water supply planning specialist	3	- - - - - - -	- - - - - - - - - - - -	1 - - - 1 - -	- - - - - - - - - - - - - - - - -	- - -
3512 Community field officer (CFO)	75	- - - - - - -	- - - - - - - - - - - -	- 7 7 7 7 - -	7 7 7 7 7 4 4 4 - - - - - - - - -	- - -
3514 Health field officer (HFO)	57	- - - - - - -	- - - - - - - - - - - -	- 7 7 7 7 - -	4 4 4 4 4 3 3 3 - - - - - - - - -	- - -
3516 Field officer (FO)	0	- - - - - - -	- - - - - - - - - - - -	- - - - - - -	- - - - - - - - - - - - - - - - -	- - -
3612 Monitoring and evaluation specialist	3	- - - - - - -	- - - - - - - - - - - -	- - - - - - -	- - - - - - - - - - - - - - - - -	- - -
3622 Participatory planning specialist	2	- - - - - - -	- - - - - - - - - - - -	- - - - - - -	1 1 - - - - - - - - - - - - - - -	- - -
3712 Administrator	17	- - - - - - -	- - - - - - - - - - - -	1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1 - - - - - - - -	- - -
Total for [Soft component services] in F	**222**	**0 0 0 0 0 0 0**	**0 0 0 0 0 0 0 0 0 0 0 0**	**0 0 0 0 0 8 5**	**6 22 22 24 18 1 4 15 17 16 15 18**	**9 9 13 0 0 0 0 0 0 0 0 0 0 0 0**
Total for Phase 2						
Total for [Design] in Phase 2	37	0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 10 12	11 4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Total for [Supervision] in Phase 2	77	0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 5 5 9 9 18 18 13	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Total for [Soft component services] in Pha	222	0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 8 5	6 22 22 24 18 1 4 15 17 16 15 18	9 9 13 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Total for Phase 2	336	0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 18 17	17 26 22 24 18 6 9 24 26 34 33 31	9 9 13 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Total of Phase 1 and Phase 2						
Total for Phase 1	332	16 22 18 24 20 22 16	6 9 22 21 23 29 30 29 7 7 11 -	- - - - - - -	- - - - - - - - - - - - - - - - -	- - -
Total for Phase 2	336	- - - - - - -	- - - - - - - - - - - -	18 17 17 26 22 24 18	6 9 24 26 34 33 31	9 9 13 - - - - - - - - - - - - -
Total of Phase 1 and Phase 2	**668**	**16 22 18 24 20 22 16**	**6 9 22 21 23 29 30 29 7 7 11 18**	**17 17 26 22 24 18 6**	**9 24 26 34 33 31**	**9 9 13 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

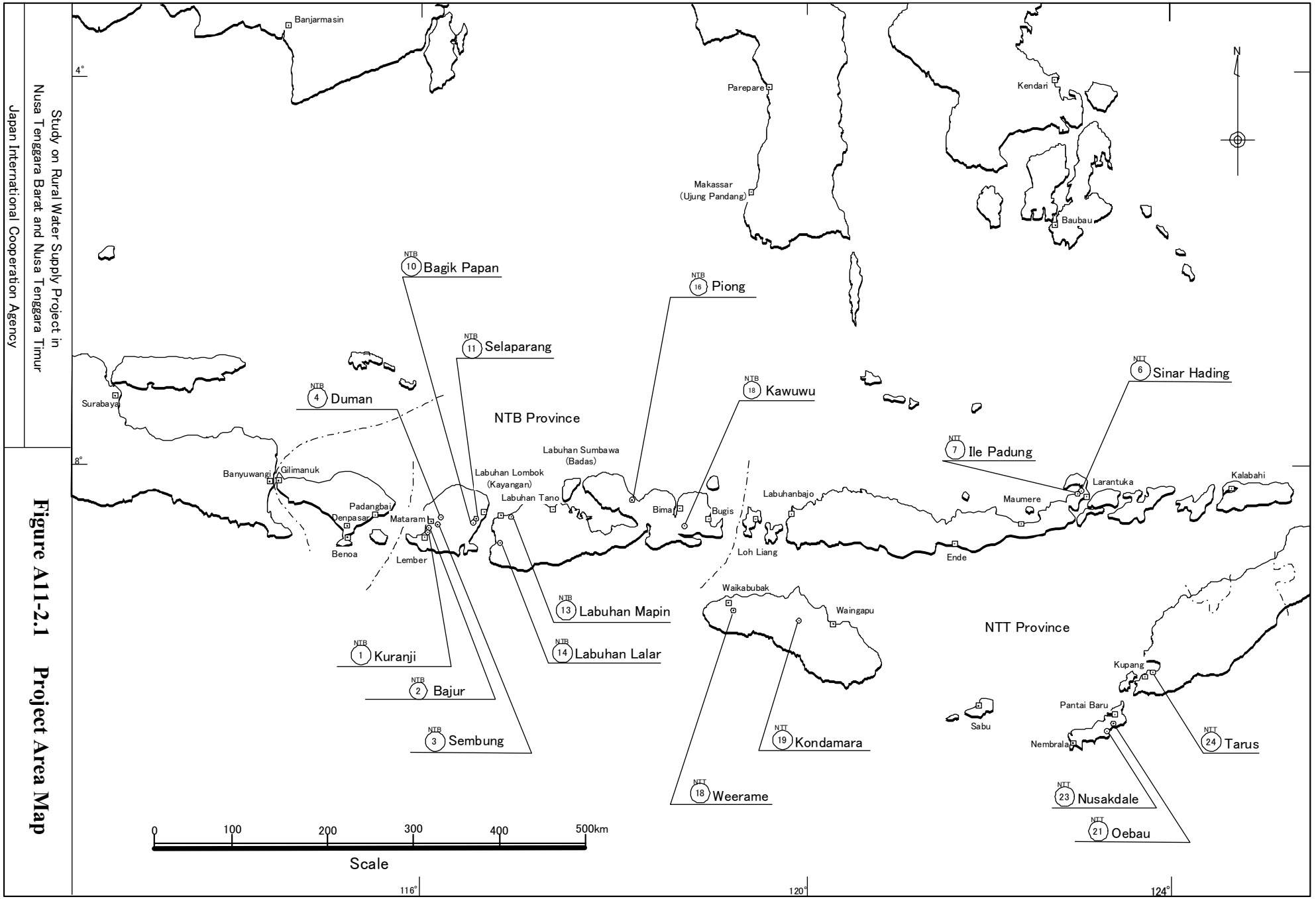
Phase 1

[Design]	21	
	16	
	37	
[Supervision]	22	
	51	
	73	
[Soft component services]	19	
	203	
	222	
Total for Phase 1	62	
	270	
	332	

Phase 2

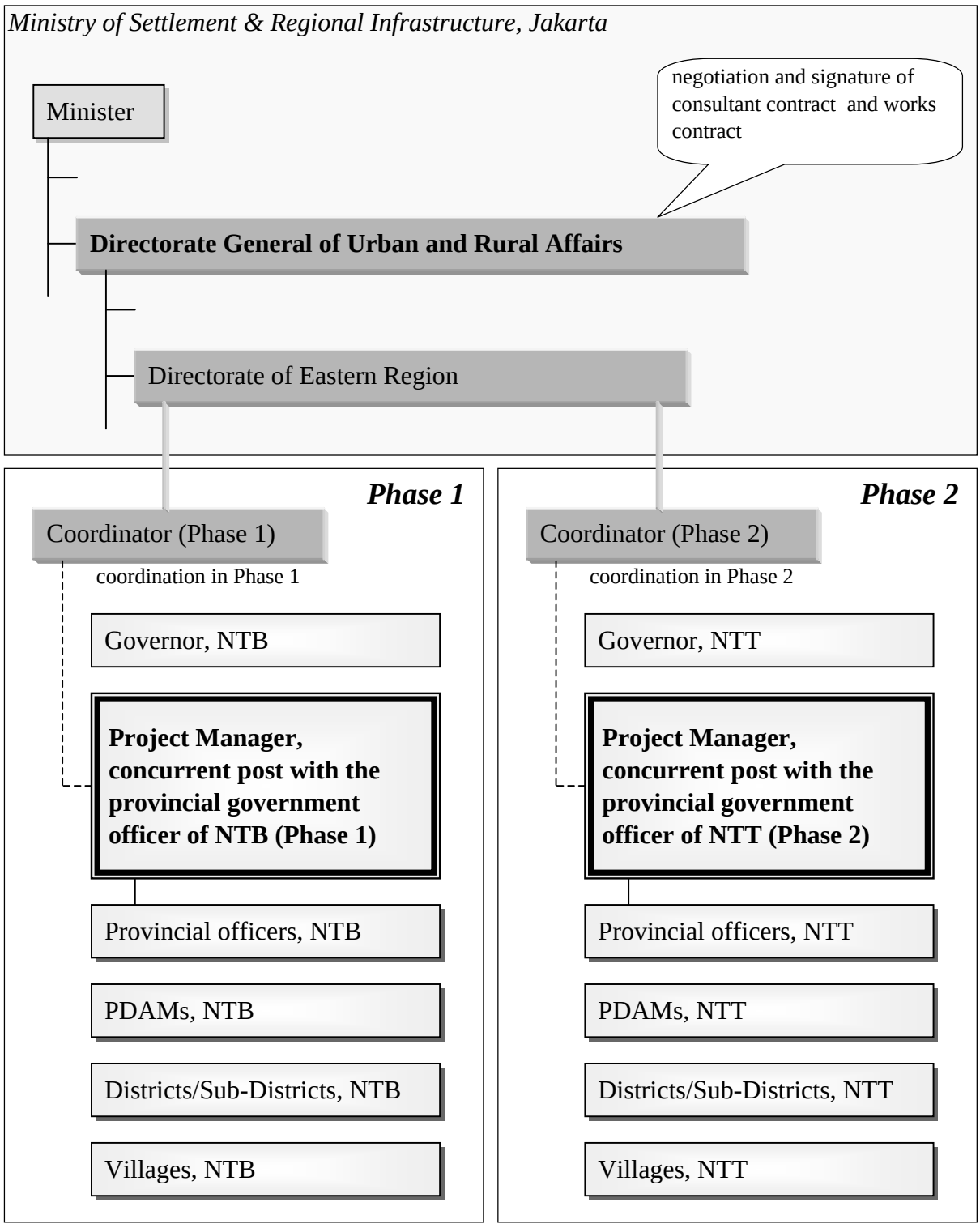
[Design]	21	
	16	
	37	
[Supervision]	20	
	57	
	77	
[Soft component services]	14	
	208	
	222	
Total for Phase 2	55	
	281	
	336	

Phase 1 + Phase 2 **668**



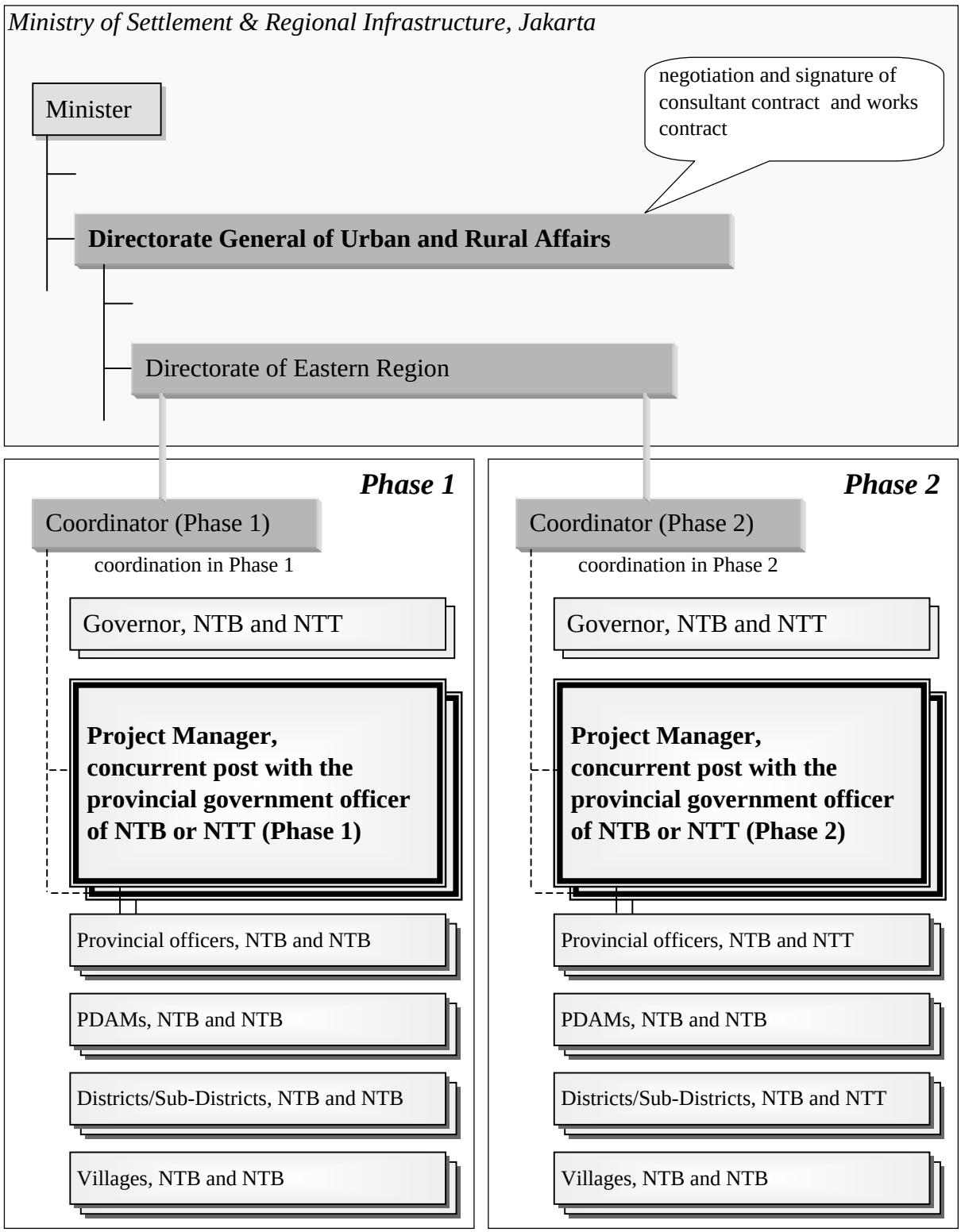
Study on Rural Water Supply Project in
Nusa Tenggara Barat and Nusa Tenggara Timur
Japan International Cooperation Agency

Figure A11-2.1 Project Area Map



The Directorate of Eastern Region will give a delegation to a provincial government officer who holds post in each of NTB (Phase 1) and NTT (Phase 2), to execute the project management.
The Directorate of Eastern Region will also dispatch a coordinator to monitor the project and to coordinate opinions and procedures among the project manager, governor, provincial offices and other related offices/agencies at each phase.

Study on Rural Water Supply Project in Nusa Tenggara Barat and Nusa Tenggara Timur	**Figure A11-2.2 (Plan 1)** **Proposed Implementation Arrangements**
Japan International Cooperation Agency	



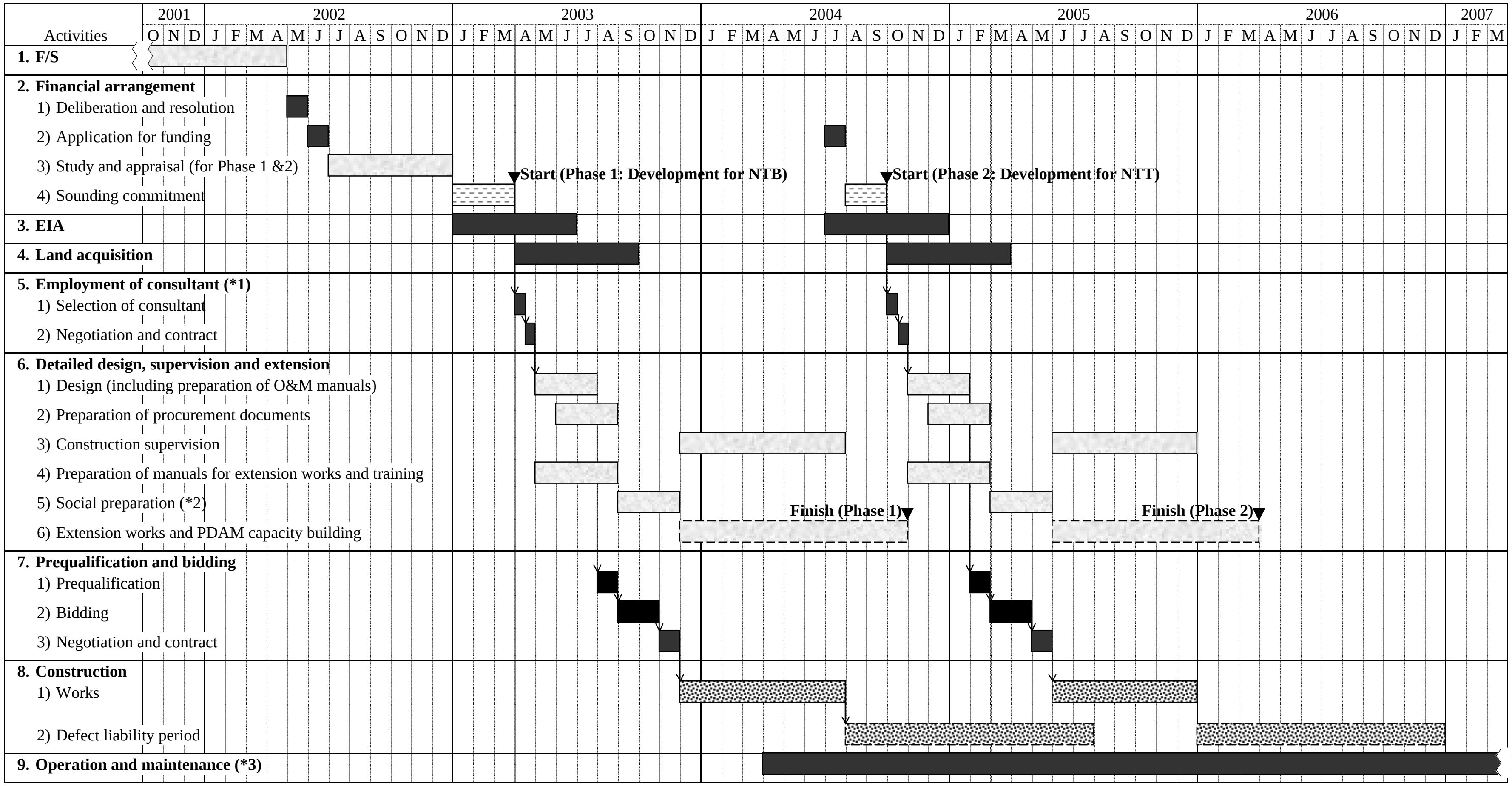
The Directorate of Eastern Region will give a delegation to two provincial government officers who holds post in NTB and NTT, to execute the project management, in each of Phase 1 and Phase 2.
The Directorate of Eastern Region will also dispatch a coordinator to monitor the project and to coordinate opinions and procedures among the project manager, governor, provincial offices and other related offices/agencies at each phase.

Study on Rural Water Supply Project in Nusa Tenggara Barat and Nusa Tenggara Timur	**Figure A11-2.3 (Plan 2)** **Proposed Implementation Arrangements**
Japan International Cooperation Agency	

Study on Rural Water Supply Project in
Nusa Tenggara Barat and Nusa Tenggara Timur

Japan International Cooperation Agency

Figure A11-2.4 (Plan 1)
Proposed Implementation Schedule



Note: - **The implementation schedule is programed under a year-month calender not to give any commitment of doner but to only show an assumption for cost estimate.**

(*1): Employment of consultant may require eight to ten months depending on the guidelines of the assistant fund provided.

(*2): Social preparation is made simultaneously with the design works to form acceptant willingness for the works in the villages.

(*3): Operation and maintenance will start during the construction period of Phase 1, assuming that the works finish progressively starting four months after the commencement of the works.
Application for funding for Phase 2 will be made after confirming the issue of operation and maintenance for Phase 1.

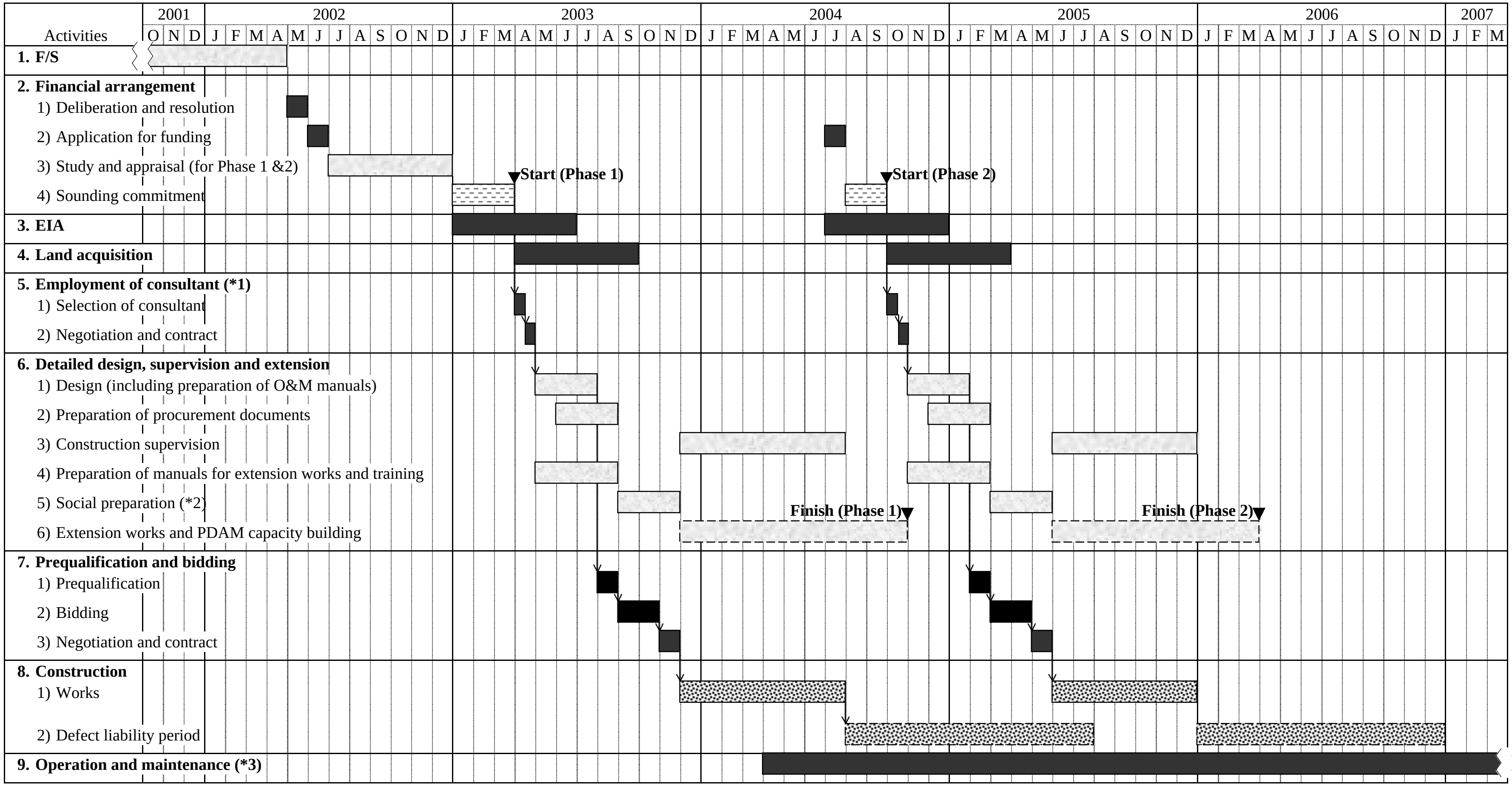
Legend:
- : Activity to be conducted by recipient country
- : Activity to be conducted by donor country
- : Activity to be performed by consultant
- : Activity to be performed by contractor

Study on Rural Water Supply Project in Nusa Tenggara Barat and Nusa Tenggara Timur

Japan International Cooperation Agency

Figure A11-2.5 (Plan 2)

Proposed Implementation Schedule



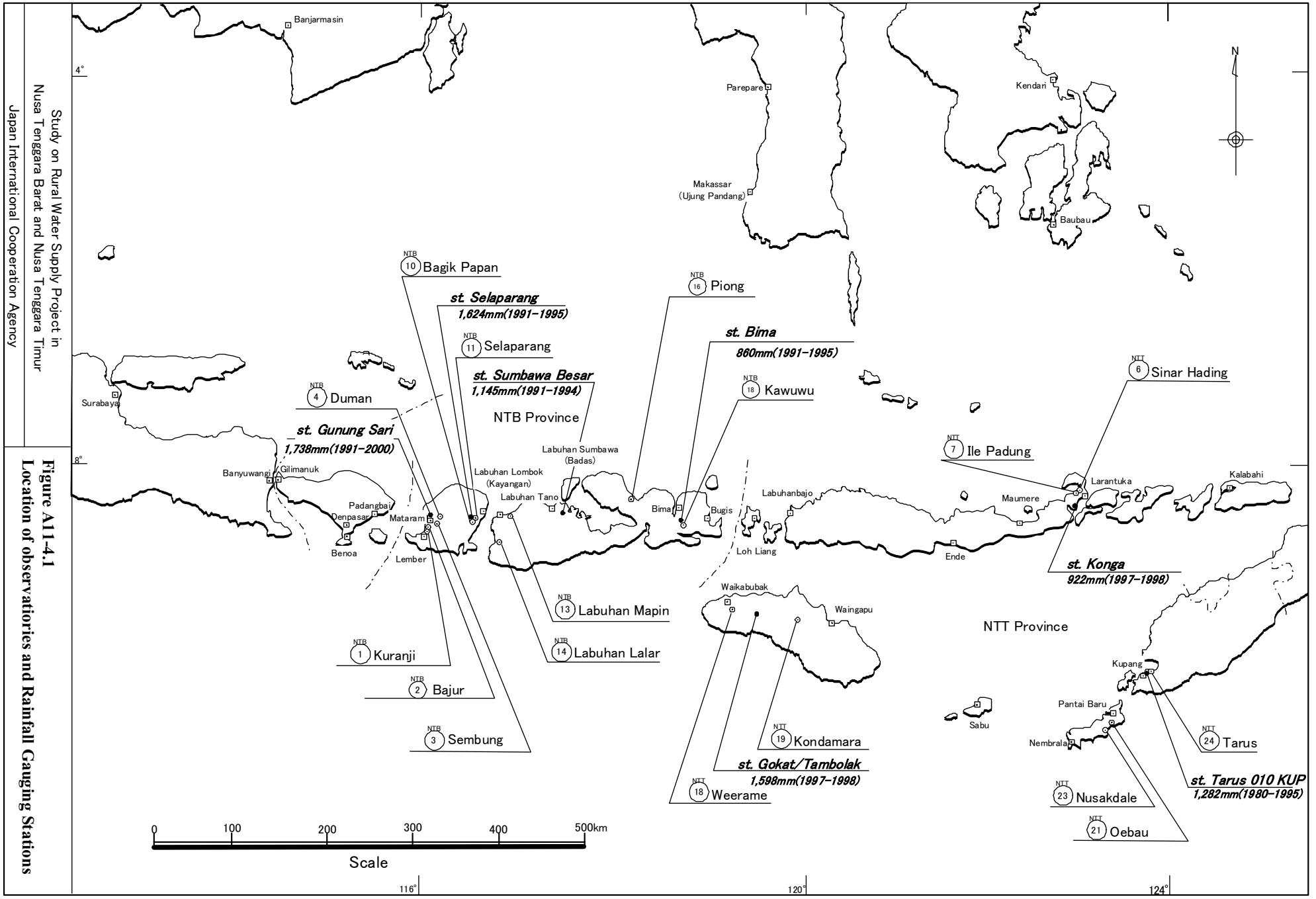
Note: - **The implementation schedule is programed under a year-month calender not to give any commitment of doner but to only show an assumption for cost estimate.**

(*1): Employment of consultant may require eight to ten months depending on the guidelines of the assistant fund provided.

(*2): Social preparation is made simultaneously with the design works to form acceptant willingness for the works in the villages.

(*3): Operation and maintenance will start during the construction period of Phase 1, assuming that the works finish progressively starting four months after the commencement of the works.
Application for funding for Phase 2 will be made after confirming the issue of operation and maintenance for Phase 1.

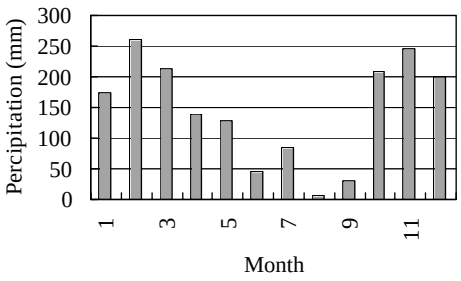
Legend:
- : Activity to be conducted by recipient country
- : Activity to be conducted by donor country
- : Activity to be performed by consultant
- : Activity to be performed by contractor

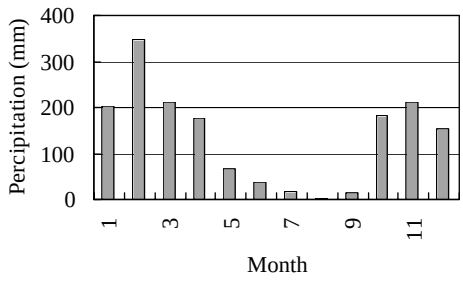


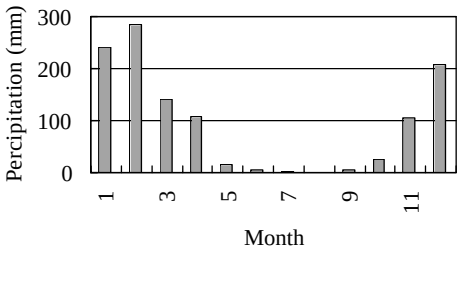
Study on Rural Water Supply Project in Nusa Tenggara Barat and Nusa Tenggara Timur

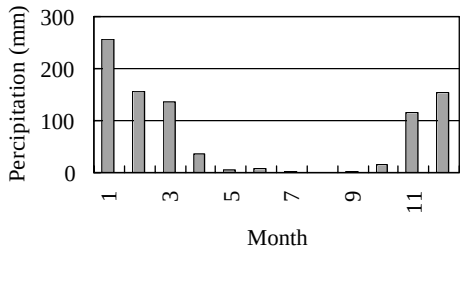
Japan International Cooperation Agency

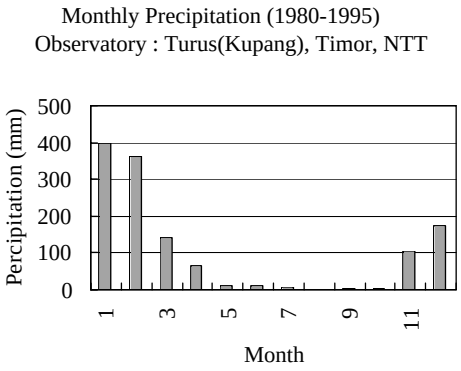
Figure A11-4.1
Location of observatories and Rainfall Gauging Stations

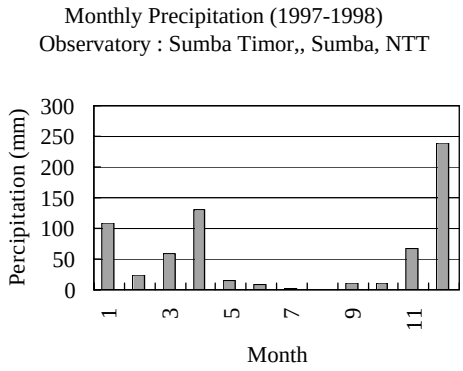


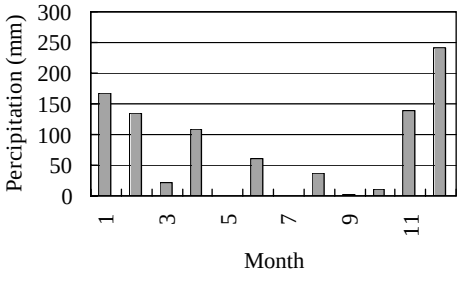




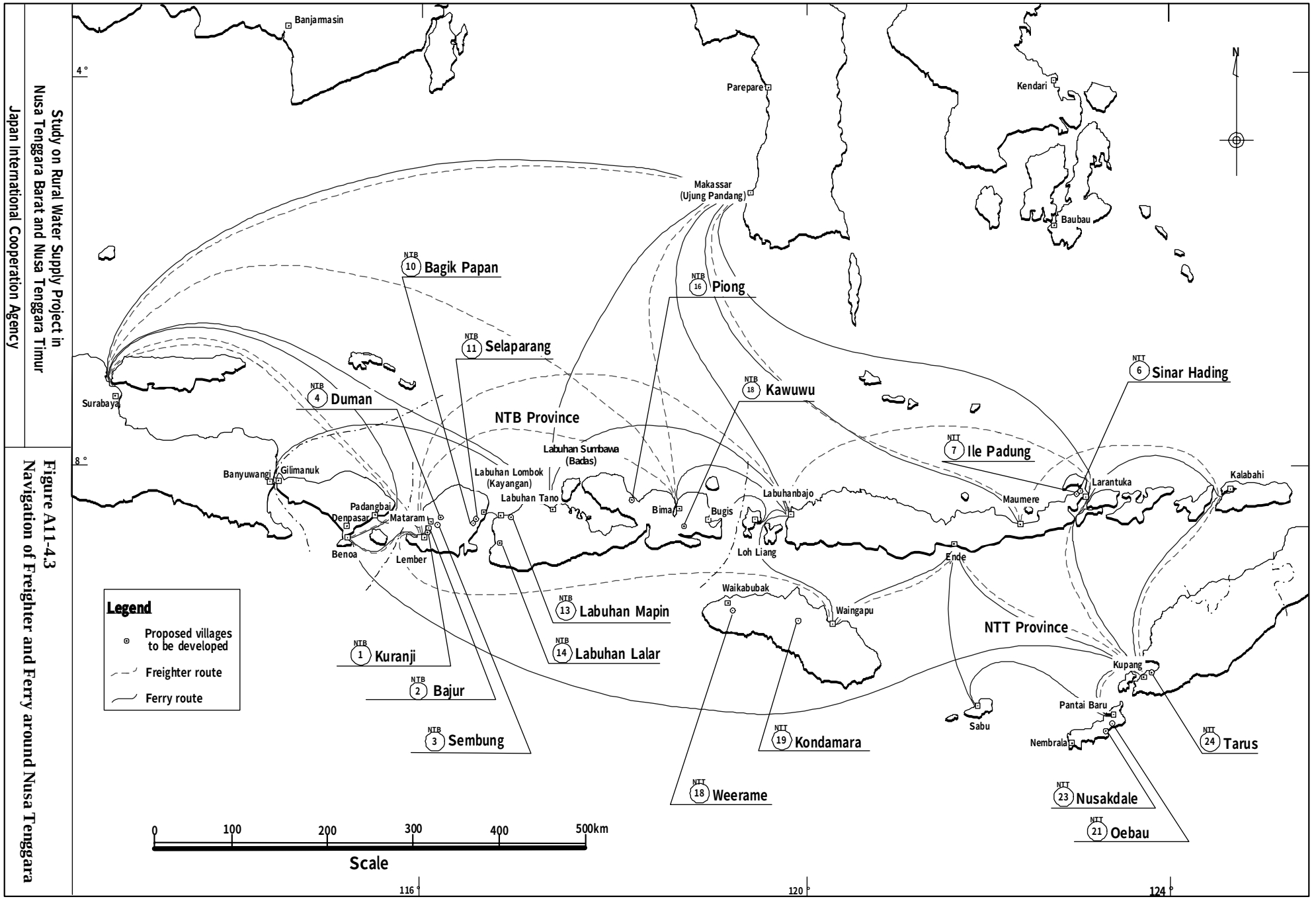






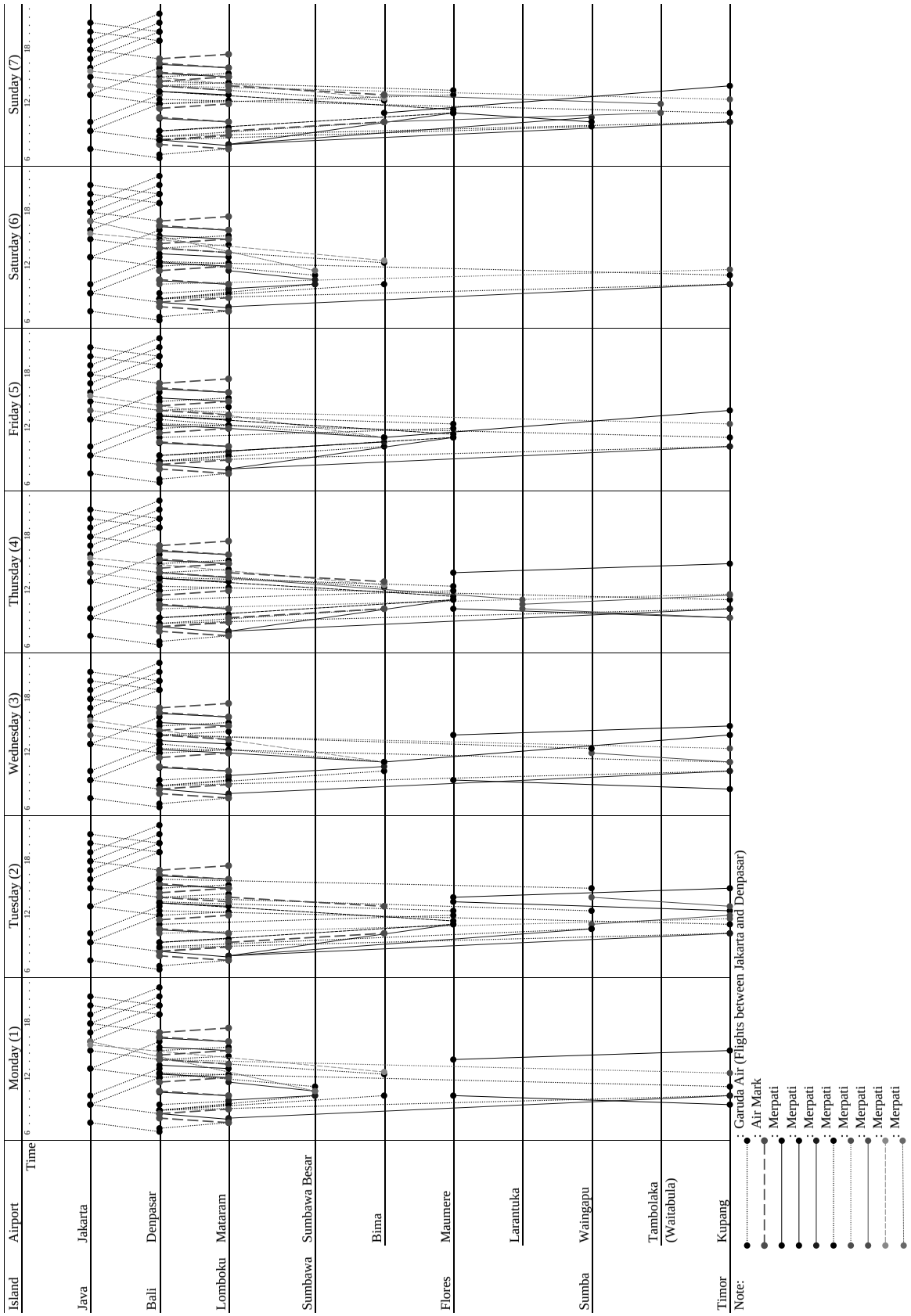


Study on Rural Water Supply Project in Nusa Tenggara Barat and Nusa Tenggara Timur	**Figure A11-4.2 Averaged Monthly Precipitation**
Japan International Cooperation Agency	



Study on Rural Water Supply Project in Nusa Tenggara Barat and Nusa Tenggara Timur
Japan International Cooperation Agency

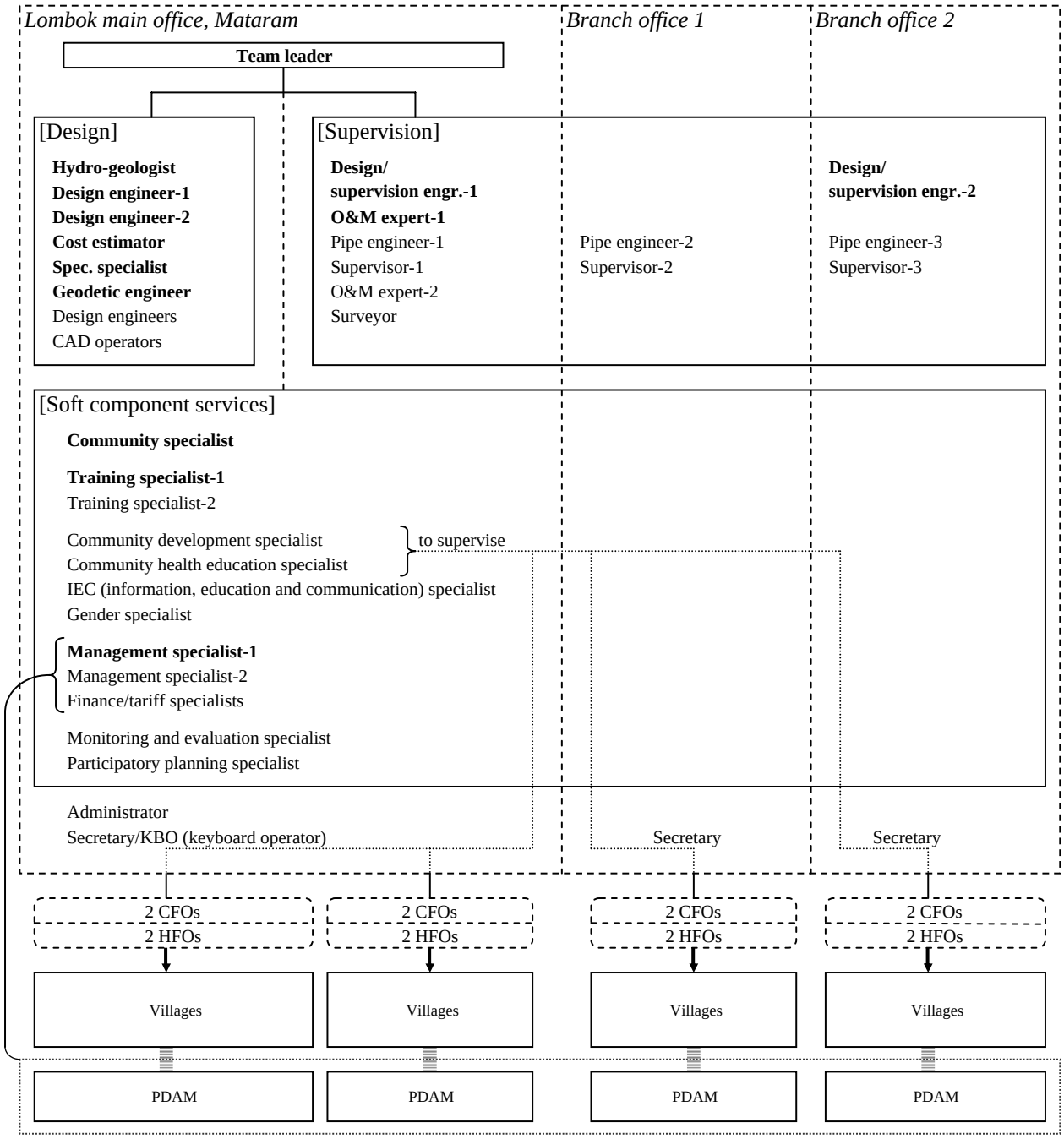
Figure A11-4.3
Navigation of Freighter and Ferry around Nusa Tenggara



Study on
Rural Water Supply Project in Nusa Tenggara Barat and Nusa Tenggara Timur

Japan International Cooperation Agency

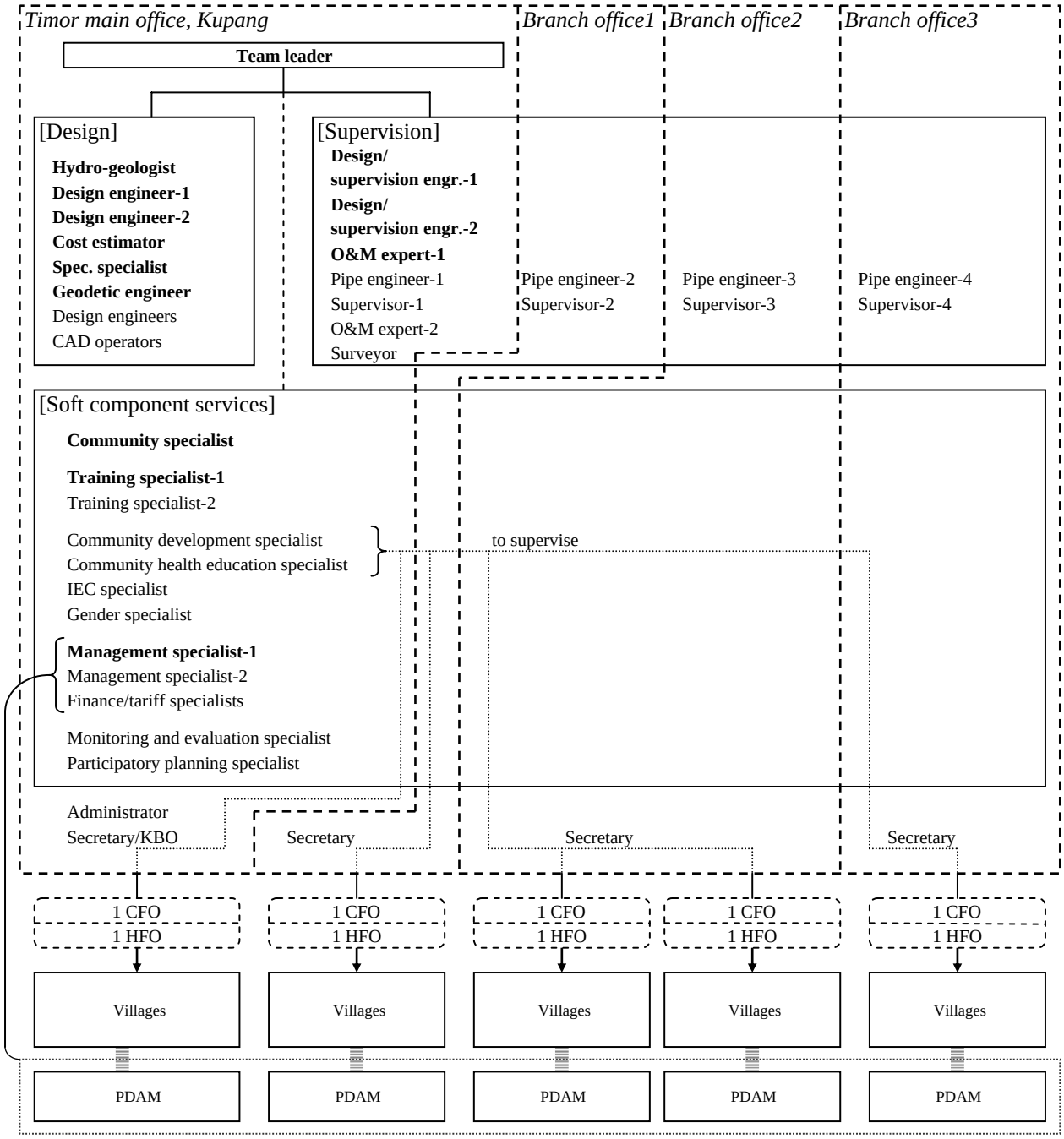
Figure A11-4.4
Weekly Flight Schedule for NTB and NTT



Phase 1 Consultant (NTB)

Note: (A): PDAM will be responsible for O&M of water supplies.
(B): Villages will be responsible for O&M of water supplies with support provided by PDAM.
(C): Villages will be responsible for O&M of water supplies.
2 CFOs : two community field officers
2 HFOs : two health field officers
- Bold specialists are foreigners, and plain local.
- Every specialist having the same title is distinguished from others suffixing "-1", "-2" and "-3".
- The main office will be provided through the implementation period, while branch offices only for construction period.

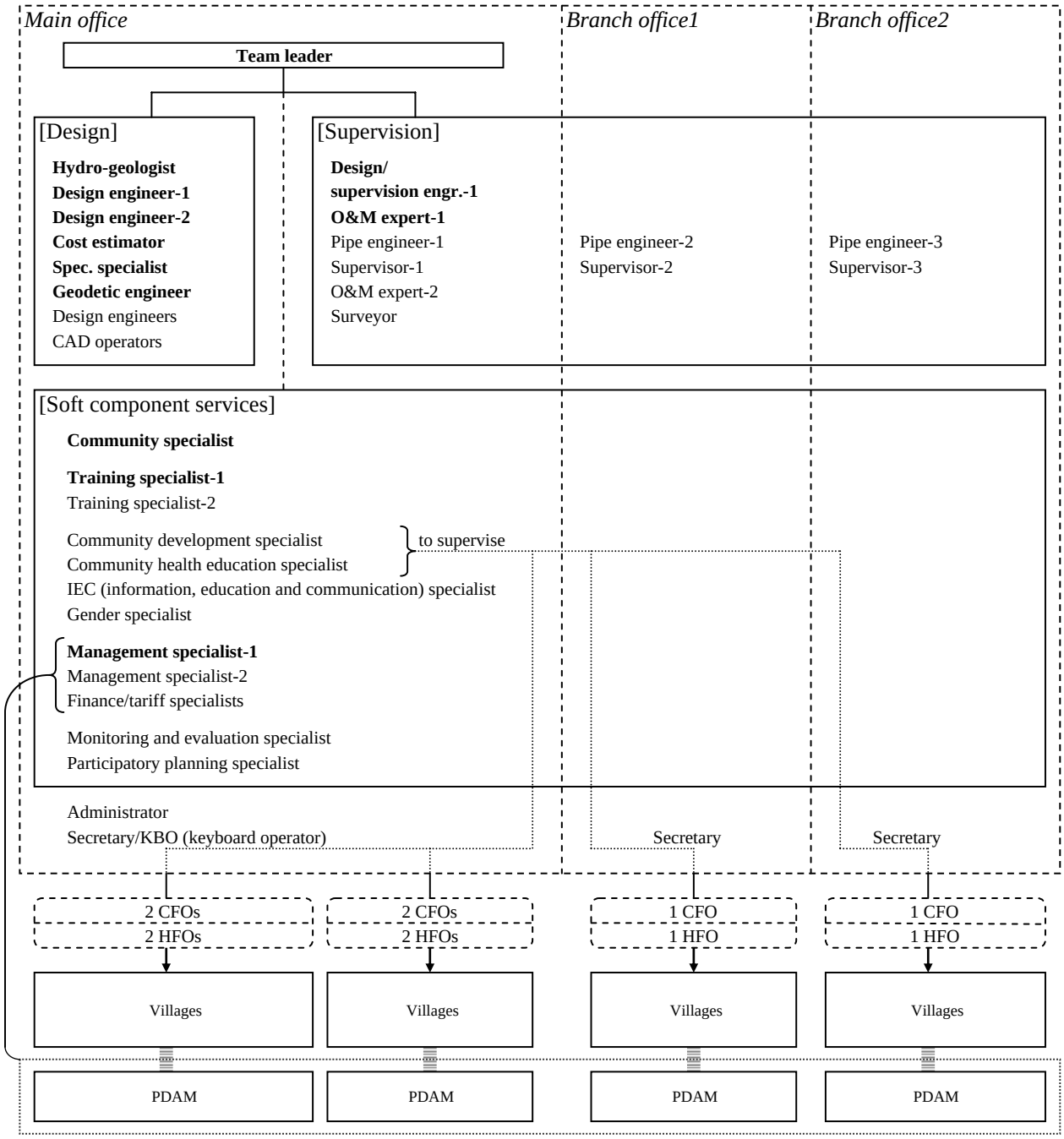
Study on Rural Water Supply Project in Nusa Tenggara Barat and Nusa Tenggara Timur Japan International Cooperation Agency	**Figure A11-7.1 (Plan 1)** **Proposed Consultant's Setup for Phase 1**



Phase 2 Consultant (NTT)

Note: (A): PDAM will be responsible for O&M of water supplies.
(B): Villages will be responsible for O&M of water supplies with support provided by PDAM.
(C): Villages will be responsible for O&M of water supplies.
2 CFOs : two community field officers
2 HFOs : two health field officers
- Bold specialists are foreigners, and plain local.
- Every specialist having the same title is distinguished from others suffixing "-1", "-2" and "-3".
- The main office will be provided through the implementation period, while branch offices only for construction period.

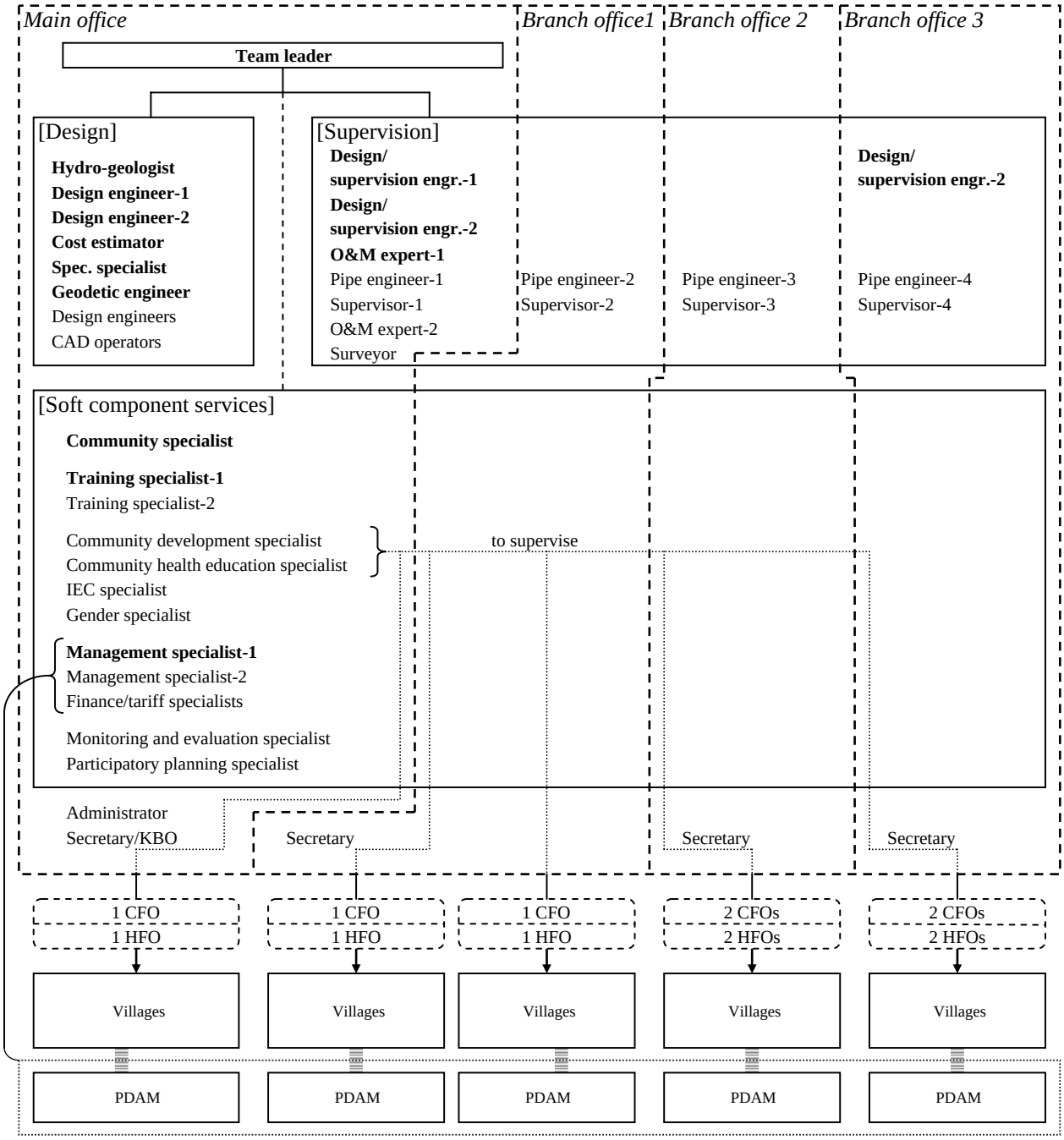
Study on Rural Water Supply Project in Nusa Tenggara Barat and Nusa Tenggara Timur Japan International Cooperation Agency	**Figure A11-7.2 (Plan 1)** **Proposed Consultant's Setup for Phase 2**



Phase 1 Consultant

Note: (A): PDAM will be responsible for O&M of water supplies.
(B): Villages will be responsible for O&M of water supplies with support provided by PDAM.
(C): Villages will be responsible for O&M of water supplies.
2 CFOs : two community field officers
2 HFOs : two health field officers
- Bold specialists are foreigners, and plain local.
- Every specialist having the same title is distinguished from others suffixing "-1", "-2" and "-3".
- The main office will be provided through the implementation period, while branch offices only for construction period.

Study on Rural Water Supply Project in Nusa Tenggara Barat and Nusa Tenggara Timur Japan International Cooperation Agency	**Figure A11-7.3 (Plan 2)** **Proposed Consultant's Setup for Phase 1**



Phase 2 Consultant

Note: (A): PDAM will be responsible for O&M of water supplies.
(B): Villages will be responsible for O&M of water supplies with support provided by PDAM.
(C): Villages will be responsible for O&M of water supplies.
2 CFOs : two community field officers
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- Bold specialists are foreigners, and plain local.
- Every specialist having the same title is distinguished from others suffixing "-1", "-2" and "-3".
- The main office will be provided through the implementation period, while branch offices only for construction period.

Study on Rural Water Supply Project in Nusa Tenggara Barat and Nusa Tenggara Timur Japan International Cooperation Agency	**Figure A11-7.4 (Plan 2)** **Proposed Consultant's Setup for Phase 2**

Appendix 12

COST ESTIMATES

Appendix 12
COST ESTIMATES

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Appendix 12 COST ESTIMATES

12.1 Conditions and Assumptions for Cost Estimates

12.1.1 Price Level

Project cost is estimated at the price level as of October 2001.

12.1.2 Currency

The cost of all items that are imported shall be estimated in Japanese yen (¥). The cost of items that are procured in the country shall be estimated in Indonesian rupiah (Rp.).

The foreign currency portion (¥) includes wages of foreign labor, costs of imported goods, international transportation cost and contractors' indirect cost and profit. The local currency portion (Rp.) includes wages of local labor, cost of goods to be purchased in the domestic market, inland transportation cost, contractor's indirect cost, compensation cost and purchasing cost of land and other real property.

For imported goods and for goods that are manufactured of or assembled from foreign materials and parts in the country, the cost will be estimated in Indonesian rupiah (Rp.) as long as they can be purchased in the domestic market.

12.1.3 Exchange Rate

The following are the exchange rates used for the cost estimate. (the mean value for selling and buying, as of the end of October, 2001)

US$ 1.0 = ¥121.92

US$ 1.0 = Rp.10,435

¥ 1.0 = Rp. 85.59

12.1.4 Project Cost Component

The following are the components of the project cost

(1) Construction cost,

(2) Consultancy service cost,

(3) Administration cost, and

(4) Land acquisition cost,

(5) Taxes and duties

Note: - Items (1) and (2) shall be estimated excluding taxes and duties.
- Items (3) and (4) shall include taxes and duties.
- Item (5) includes all the taxes and duties levied on items (1) and (2).
- Items (1), (2), (3), (4), and (5) include physical and price contingencies.

Cost for the civil works including equipment supply and for the consulting services will be financed under a loan to be agreed between the government of Indonesia and a foreign country or other assistant fund, or under a grant aid. Other costs than the construction and consultancy services will be borne by the Government of Indonesia.

12.1.5 Construction Cost

Construction works and the supply of equipment will be executed on a contract basis through international competitive bidding (ICB). All the labor, materials and equipment required for the works will be provided by the contractor.

The works will be executed under a contract. The contract will be a unit price contract. The contract price is estimated by multiplying work quantities by unit prices estimated.

Each of the unit prices (rates) are estimated as the sum of labor wages, material cost, equipment cost, and overhead and profit. The following are referred to for fixing the unit rate.

- Unit Rate for Construction Works-2000, Ministry of Publics Works Cipta Karya,
- Journal of Building Construction and Interior-May 2001, the 16th edition,
- Law of Manpower, Law of The Republic of Indonesia No.1 Year 1951,
- Regulation of The Ministry of Labor No:Per.06/Men/1993,
- Law of Manpower, Law of The Republic of Indonesia No.25 Year 1997,

Overhead and profits for the contractor is set at 25 % of the net cost of carrying out the construction works.

12.1.6 Consulting Services Cost

A consultant will be employed for design, supervision, and extension services for the project by the Government of Indonesia, under the loan or grant aid to be agreed.

The major scope of works of the consultant will be the following:

(i) Engineering services:

- Detailed design including preparation of procurement documents,
- Construction supervision,

(ii) Soft component services:

- Soft component services (health and hygiene education, community development and PDAM capacity building).

12.1.7 Administration Cost

Administration cost includes all the expenses required for the administrative activities, directly associated with the project implementation, such as personnel, vehicle, training and office running costs. This cost will be provided by the executing agencies.

12.1.8 Land Acquisition Cost

The Government of Indonesia will be responsible for the cost of land acquisition for the facilities to be constructed.

In practice, the land costs depend on the village, topography and present land use. In this report, however, the cost is estimated, based on a common unit rate using the average land price, since the land needed for the facilities has not been finalised yet. The area of land is estimated assuming that half of the land would be required for facilities such as pump houses, BPTs (break pressure tanks), public hydrants and public taps.

12.1.9 Taxes and Duties

Taxes and duties are estimated based on the following:

- Government Regulation Number 42 of the Year 1995
- Ministry of Finance decree Number 486/KMK.04/2000,
- Director General of Taxation decree Number Kep-526/PJ/2000,

(i) Customs duty

The goods to be imported for public works will be exempted from Customs duty, as will equipment supplied under grant and loan projects in Indonesia. Neither customs duty nor extra duty is estimated on the works.

(ii) Value-added Tax (VAT)

Value-added tax (VAT) is levied at a rate of 10% against that part of the contract amount that is funded by the National Budget (A.P.B.N). The portion of the contract that is funded by foreign loan is not subject to VAT or luxury tax). This applies to the main contractors, subcontractors, suppliers and consultants that are to work for the project.

For the work portion that is to be borne by the Government of Indonesia, VAT will be levied at a rate of 10 %. For the remainder of the work, value-added tax is estimated at 0 (zero) percent, assuming that the non-GOI contract cost is funded entirely by foreign loan or grant aid.

12.1.10 Physical Contingency

Physical contingency is estimated at 5% to 15% depending on the accuracy of design. The physical contingency is included in each of the cost component.

12.1.11 Price Contingency

Price escalation rates are set at 0.4% per annum for the foreign currency portion and 7.5% per annum for local currency portion, as estimated in Table A12-1.1. The rate of price contingency for each project component is estimated in Table A12-1.2. The price contingency is included in each of the cost components.

12.2 Estimate of Unit Rate

12.2.1 Labor Wage

The different labor wages for skilled, semi-skilled and unskilled labor by trade have been obtained from the Unit Rate for Construction Works-2000, Ministry of Public Works Cipta Karya, concerning the minimum labor wage for public and construction works sector.

The daily wage of workers is estimated in accordance with the law and guidelines of the Government of Indonesia (Section 4.1.9 of Appendix 11). Estimated wages of workers are listed in Table A12-2.1.

12.2.2 Material Prices

Almost all materials required for the construction are available in Indonesia and the rest are imported. The locally produced items have been obtained from reputable manufactures and suppliers. The prices for imported materials have been fixed by obtaining quotations from major importers of such items. Material prices are listed in Table A12-2.2.

12.2.3 Hourly/daily Cost of Equipment

The hourly/daily cost of major equipment is estimated based on the quotations for equipment lease. The estimated hourly/daily cost of equipment is listed in Table A12-2.3.

12.2.4 Estimated Unit Rate

The following are the assumptions used for estimating the unit rate for each of the construction work items.

- The same wages, unit price, and unit rate of works are used in each village, regardless of province.
- Unit prices of construction materials are the cost at the ports close to the villages. The transportation cost from the ports to the villages is included in the overhead and profit estimated in each of the unit rates.
- The unit rate of pipe laying work includes the cost of the fittings, such as joints, bends, valves, etc.. that is 30 % of the pipe laying work cost (including pipe material cost).

Estimated unit rates of the major work items are listed in Table A12-2.4.

12.3 Project Cost

12.3.1 Construction Cost

The estimated construction cost is summarized below.

Estimated construction cost (Plan 1)

No.	Item	Foreign portion (Y, million)	Local portion (Rp., million)	Total (Y, million)	Equivalent (Rp., billion)
Phase 1	**NTB**				
1.	Preparatory works	51.4	0	51.4	4.4
2.	Water works	154.3	1,106.9	167.2	14.3
3.	Physical contingency	30.8	166.0	32.8	2.8
4.	Price contingency	46.8	305.5	50.4	4.3
	Total for Phase 1 (NTB)	283.3	1,578.4	301.7	25.8
Phase 2	**NTT**				
1.	Preparatory works	58.1	0	58.1	5.0
2.	Water works	98.2	605.9	105.3	9.0
3.	Physical contingency	23.5	90.9	24.5	2.1
4.	Price contingency	46.5	236.9	49.3	4.2
	Total for Phase 2 (NTT)	226.3	933.7	237.2	20.3
	Total of Phase 1 and Phase 2	**509.5**	**2,512.1**	**538.9**	**46.1**

Note: Price level: October 2001
Foreign portion : Amount that may be financed by foreign assistant agency
Local portion : Amount that would be borne by Government of Indonesia

A breakdown of the above estimate is given in Table A12-3.1 (Plan 1) for Plan 1 development.

Estimated construction cost (Plan 2)

No.	Item	Foreign portion (Y, million)	Local portion (Rp., million)	Total (Y, million)	Equivalent (Rp., billion)
Phase 1					
1.	Preparatory works	51.5	0	51.5	4.4
2.	Water works	137.2	1,035.7	149.3	12.8
3.	Physical contingency	28.3	155.4	30.1	2.6
4.	Price contingency	42.1	285.9	45.5	3.9
	Total for Phase 1	259.2	1,477.0	276.4	23.7
Phase 2					
1.	Preparatory works	59.8	0	59.8	5.1
2.	Water works	115.2	677.1	123.1	10.5
3.	Physical contingency	26.3	101.6	27.4	2.3
4.	Price contingency	53.8	264.7	56.9	4.9
	Total for Phase 2	255.1	1,043.3	267.2	22.9
	Total of Phase 1 and Phase 2	**514.2**	**2,520.3**	**543.7**	**46.5**

Note: Price level: October 2001
Foreign portion : Amount that may be financed by foreign assistant agency
Local portion : Amount that would be borne by Government of Indonesia

A breakdown of the above estimate is given in Table A12-3.2 (Plan 2) for Plan 2 development.

Another breakdown of the water works cost by village is given in and Table A12-3.3.

12.3.2 Consulting Service Cost

The following are the estimated amounts for consulting services.

Estimated consulting service cost (Plan 1)

No.	Item	Amount (Y, million)		Equivalent (Rp., billion)
Phase 1	**NTB**			
1.	Consulting service cost			
	1) Detailed design	64.9	(34 %)	5.6
	2) Construction supervision	67.6	(36 %)	5.8
	3) Soft component services	56.1	(30 %)	4.8
	Sub-total for 1.	188.6	(100 %)	16.1
2.	Physical contingency	9.4		0.8
3.	Price contingency	7.8		0.7
	Total for Phase 1 (NTB)	205.9		17.6
Phase 2	**NTT**			
1.	Consulting service cost			
	1) Detailed design	61.6	(36 %)	5.3
	2) Construction supervision	64.9	(38 %)	5.6
	3) Soft component services	43.9	(26 %)	3.8
	Sub-total for 1.	170.4	(100 %)	14.6
2.	Physical contingency	8.5		0.7
3.	Price contingency	9.9		0.8
	Total for Phase 2 (NTT)	188.8		16.2
	Total of Phase 1 and Phase 2	**394.7**		**33.8**

Note: Price level: October 2001

A breakdown of the above estimate is given in Table A12-3.4 (Plan 1) for Plan 1 development.

Estimated consulting service cost (Plan 2)

No.	Item	Amount (Y, million)		Equivalent (Rp., billion)
Phase 1				
1.	Consulting service cost			
	1) Detailed design	65.4	(34 %)	5.6
	2) Construction supervision	69.7	(37 %)	6.0
	3) Soft component services	55.3	(29 %)	4.7
	Sub-total for 1.	190.3	(100 %)	16.3
2.	Physical contingency	9.5		0.8
3.	Price contingency	8.1		0.7
	Total for Phase 1	207.9		17.8
Phase 2				
1.	Consulting service cost			
	1) Detailed design	62.0	(32 %)	5.3
	2) Construction supervision	63.2	(32 %)	5.4
	3) Soft component services	49.6	(26 %)	4.2
	Sub-total for 1.	174.9	(100 %)	15.0
2.	Physical contingency	8.7		0.7
3.	Price contingency	12.0		1.0
	Total for Phase 2	195.6		16.7
	Total of Phase 1 and Phase 2	**403.5**		**34.5**

Note: Price level: October 2001

A breakdown of the above estimate is given in Table A12-3.5 (Plan 2) for Plan 2 development.

Another breakdown of the preparation cost of manuals for community extension works and PDAM capacity building, that is a part of the soft component services, is given in Table A12-3.6 (Plan 1) and Table A12-3.7 (Plan 2) for Plan 1 development and Plan 2 development, respectively

12.3.3 Administration Cost

The following are the estimated administration costs.

Estimated administration cost (Plan 1)

No.	Item	Amount (Y, million)	Equivalent (Rp., billion)
Phase 1	Administration cost	12.1	1.0
Phase 2	Administration cost	14.0	1.2
	Total of Phase 1 and Phase 2	**26.1**	**2.2**

Note: Price level: October 2001

A breakdown of the above estimate is given in Table A12-3.8 (Plan 1) for Plan 1 development.

Estimated administration cost (Plan 2)

No.	Item	Amount (Y, million)	Equivalent (Rp., billion)
Phase 1	Administration cost	13.8	1.2
Phase 2	Administration cost	15.7	1.3
	Total of Phase 1 and Phase 2	**29.5**	**2.5**

Note: Price level: October 2001

A breakdown of the above estimate is given in Table A12-3.9 (Plan 2) for Plan 2 development.

12.3.4 Land Acquisition Cost

The following are the estimated costs of land acquisition.

Estimated land acquisition cost (Plan 1)

No.	Item	Amount (Y, million)	Equivalent (Rp., billion)
Phase 1	Land acquisition cost	0.08	0.006
Phase 2	Land acquisition cost	0.03	0.003
	Total of Phase 1 and Phase 2	**0.11**	**0.009**

Note: Price level: October 2001

Estimated land acquisition cost (Plan 2)

No.	Item	Amount (Y, million)	Equivalent (Rp., billion)
Phase 1	Land acquisition cost	0.07	0.006
Phase 2	Land acquisition cost	0.04	0.003
	Total of Phase 1 and Phase 2	**0.11**	**0.009**

Note: Price level: October 2001

12.3.5 Taxes and Duties

The following are the estimated taxes and duties to be levied on the construction and consulting services.

Estimated taxes and duties (Plan 1)

No.	Item	Amount (Y, million)	Equivalent (Rp., billion)
1.	Value-added tax (VAT)	2.9	0.25
2.	Customs duty	0	0
	Total of 1.-2.	**2.9**	**0.25**

Note: VAT is levied at 10% of the works that would be borne by GOI. No customs duty is estimated because no equipment and materials would be imported under the project.

Estimated taxes and duties (Plan 2)

No.	Item	Amount (Y, million)	Equivalent (Rp., billion)
1.	Value-added tax (VAT)	2.9	0.25
2.	Customs duty	0	0
	Total of 1.-2.	**2.9**	**0.25**

Note: VAT is levied at 10% of the works that would be borne by GOI. No customs duty is estimated because no equipment and materials would be imported under the project.

12.3.6 Project Cost

The following is the estimated project cost for the options outlined in this chapter.

Estimated project cost (Plan 1)

No.	Item	Total		Foreign portion		Local portion	
		Yen (Y, million)	Equivalent (Rp., billion)	Yen (Y, million)	Equivalent (Rp., billion)	Yen (Y, million)	Equivalent (Rp., billion)
Phase 1	**NTB**						
1.	Construction cost	301.7	25.8	283.3	24.2	18.4	1.6
2.	Consultancy services cost	205.9	17.6	205.9	17.6	0	0
3.	Administration cost	12.1	1.0	0	0	12.1	1.0
4.	Land acquisition cost	0.08	0.007	0	0	0.08	0.007
5.	Taxes and duties	1.8	0.16	0	0	1.8	0.16
	Total for Phase 1 (NTB)	521.6	44.6	489.2	41.9	32.5	2.8
Phase 2	**NTT**						
1.	Construction cost	237.2	20.3	226.3	19.4	10.9	0.9
2.	Consultancy services cost	188.8	16.2	188.8	16.2	0	0
3.	Administration cost	14.0	1.2	0	0	14.0	1.2
4.	Land acquisition cost	0.03	0.003	0	0	0.03	0.003
5.	Taxes and duties	1.1	0.09	0	0	1.1	0.09
	Total for Phase 2 (NTT)	441.1	37.8	415.1	35.5	26.0	2.2
Total of Phase 1 and Phase 2		**962.7**	**82.4**	**904.3**	**77.4**	**58.5**	**5.0**

Note: Price level: October 2001
Foreign portion : Amount that may be financed by foreign assistant agency
Local portion : Amount that would be borne by Government of Indonesia

A breakdown of the above estimate is given in Table A12-3.10 (Plan 1) for Plan 1 development.

Estimated project cost (Plan 2)

No.	Item	Total		Foreign portion		Local portion	
		Yen (Y, million)	Equivalent (Rp., billion)	Yen (Y, million)	Equivalent (Rp., billion)	Yen (Y, million)	Equivalent (Rp., billion)
Phase 1							
1.	Construction cost	276.4	23.7	259.2	22.2	17.3	1.5
2.	Consultancy services cost	207.9	17.8	207.9	17.8	0	0
3.	Administration cost	13.8	1.2	0	0	13.8	1.2
4.	Land acquisition cost	0.07	0.006	0	0	0.07	0.006
5.	Taxes and duties	1.7	0.15	0	0	1.7	0.15
	Total for Phase 1	499.9	42.8	467.1	40.0	32.8	2.8
Phase 2							
1.	Construction cost	267.3	22.9	255.1	21.8	12.2	1.0
2.	Consultancy services cost	195.6	16.7	195.1	16.7	0	0
3.	Administration cost	15.7	1.3	0	0	15.7	1.3
4.	Land acquisition cost	0.04	0.003	0	0	0.04	0.003
5.	Taxes and duties	1.2	0.10	0	0	1.2	0.1
	Total for Phase 2	479.8	41.1	450.7	38.6	29.2	2.5
Total of Phase 1 and Phase 2		**979.7**	**83.9**	**917.8**	**78.6**	**62.0**	**5.3**

Note: Price level: October 2001
Foreign portion : Amount that may be financed by foreign assistant agency
Local portion : Amount that would be borne by Government of Indonesia

A breakdown of the above estimate is given in Table A12-3.11 (Plan 2) for Plan 2 development.

12.4 Operation and Maintenance Cost

12.4.1 Annual Operation and Maintenance Cost

Annual operation and maintenance (O&M) costs consist of:

1) Salaries and wages,

2) Operation cost, and

3) Maintenance cost of the facility.

The operation and maintenance cost at the full development stage is estimated below.

Estimated annual operation and maintenance cost

No.	Item	Amount (Y, thousand)	Equivalent (Rp., thousand)
1.	Annual operation and maintenance	2,090	178,743

Note: Price level: October 2001

A breakdown of the above estimate is given in Table A12-4.1.

12.4.2 Replacement Cost

Some of the project facilities, especially equipment and mechanical works such as pumps and generators, have a shorter useful life than the civil and pipe works. The life of the pumps and generators is set at 15 years, while the PVC pipe laid underground and the GSP (galvanized steel pipe) exposed could be usable for about twenty years and more respectively. Since the project life is set at 20 years for the pipe works, replacement cost is only estimated for the pumps and generators whose life expectancy is less than that of the pipe works.

The following are the estimated replacement cost.

Estimated replacement cost

No.	Item	Replacement cycle	Amount (Y, thousand)	Equivalent (Rp., thousand)
1.	Replacement cost	15 years	5,854	501,034

Note: Price level: October 2001

A breakdown of the above estimate is given in Table A12-4.2.

Since it is hard for villagers to pay for the replacement cost in the year of replacement, the villagers are to save money regularly every month for replacement at 15 years.

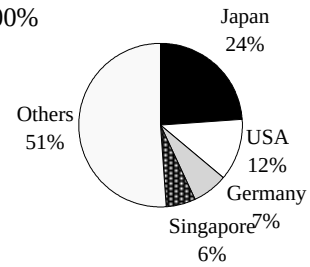
Table A12-1.1 Estimate of Price Escalation Rate

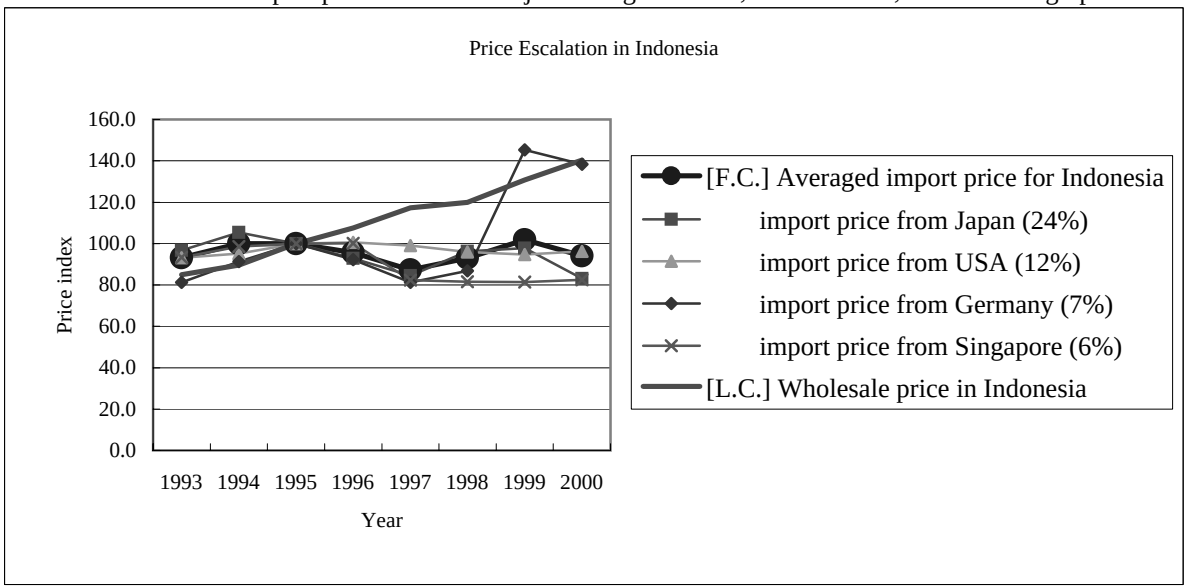
Year	Foreign currency portion: International market (Import)[*1]														Local currency portion: Domestic market		
	Export price indices				Exchange rate (per US dollar)				Estimated import price for Indonesia						Wholesale price		Reference
	Japan	USA	Germany	Singapore	Japan	USA	Germany	Singapore	Japan	USA	Germany	Singapore	Average[*2]	Escalation	Index	Escalation	Exch. rate
1993	105.2	93.2	97.8	106.1	111.85	1.0	1.7263	1.6080	96.7	93.2	81.2	93.3	93.2		85.0		2,110.0
1994	102.2	95.2	98.6	101.8	99.74	1.0	1.5488	1.4607	105.4	95.2	91.3	98.6	100.0	7.3%	89.6	5.4%	2,200.0
1995 *3	**100.0**	**100.0**	**100.0**	**100.0**	102.83	1.0	1.4335	1.4143	100.0	100.0	100.0	100.0	100.0	0.0%	100.0	11.6%	2,308.0
1996	104.8	100.6	100.0	99.1	116.00	1.0	1.5548	1.3998	92.9	100.6	92.2	100.1	95.6	-4.4%	107.5	7.5%	2,383.0
1997	106.7	99.0	101.5	97.6	129.95	1.0	1.7921	1.6755	84.4	99.0	81.2	82.4	87.3	-8.7%	117.3	9.1%	4,650.0
1998	108.2	95.9	101.4	95.7	115.60	1.0	1.6730	1.6605	96.2	95.9	86.9	81.5	93.0	6.6%	120.0	2.3%	8,025.0
1999	97.2	94.7	100.9	95.9	102.20	1.0	0.9954	1.6660	97.8	94.7	145.3	81.4	101.8	9.5%	130.8	9.0%	7,085.0
2000	92.9	96.2	103.9	101.0	114.90	1.0	1.0772	1.7315	83.1	96.2	138.3	82.5	94.1	-7.5%	140.4	7.3%	9,595.0
Average														**0.4%**		**7.5%**	
Radical number minus one, [= (Index$_{2000}$ / Index$_{1993}$)^(1/7) -1] (for the reference only)														0.1%		7.4%	

Note: - Data resource for price indices and exchange rates: International Finance Statistics, IMF, February 2001

*1: Price escalation rate for foreign currency portion is estimated based on the export price indices of major trading countries, for Indonesia, as listed and graphed below

Japan	24%
USA	12%
Germar	7%
Singapor	6%
Others	51%
Total	100%





*2: weighted average of import price

*3: indices are set at 100 in 1995.

Table A12-1.2 Rate of Price Contingency

(Unit: %)

	Construction works						Consultancy services						Land acquisition						Administration					
	Phase 1			Phase 2			Phase 1			Phase 2			Phase 1			Phase 2			Phase 1			Phase 2		
Year	dis.	F.C	L.C	dis.	F.C	L.C	dis.	F.C	L.C	dis.	F.C	L.C	dis.	F.C	L.C	dis.	F.C	L.C	dis.	F.C	L.C	dis.	F.C	L.C
2001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2003	10	-	2	-	-	-	50	-	8	-	-	-	100	1	16	-	-	-	50	-	8	-	-	-
2004	90	1	22	-	-	-	50	1	12	40	-	10	-	-	-	50	1	12	50	1	12	40	-	10
2005	-	-	-	100	2	34	-	-	-	55	1	18	-	-	-	50	1	17	-	-	-	50	1	17
2006	-	-	-	-	-	-	-	-	-	5	-	2	-	-	-	-	-	-	-	-	-	10	-	4
2007	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2009	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	100	**1**	**24**	100	**2**	**34**	100	**1**	**20**	100	**1**	**30**	100	**1**	**16**	100	**2**	**29**	100	**1**	**20**	100	**1**	**31**

Note: - Price level: October 2001

- Price escalation rate (per annum)
  F.C: 0.40%
  L.C: 7.50%

Table A12-2.1 Wage of Workers

Trade	Unit	Basic wage (Rp.)	Surcharge *1 22%	Surcharge *2 25%	Total wage (Rp.)
Civil and Building Works (Daily basi					
Foreman (general)	day	23,500	5,170	5,875	35,000
Skilled labor	day	22,000	4,840		27,000
Common labor (unskilled)	day	12,500	2,750		15,000
Operator, heavy equipment	day	27,500	6,050	6,875	40,000
Operator, medium equipment	day	25,000	5,500	6,250	37,000
Operator, light equipment	day	22,000	4,840		27,000
Operator, plant	day	25,000	5,500		31,000
Assistant operator	day	16,500	3,630		20,000
Driver, dump truck	day	25,000	5,500		31,000
Driver, vehicle	day	22,000	4,840		27,000
Mechanic	day	22,000	4,840		27,000
Assistant mechanic	day	16,500	3,630		20,000
Electrician	day	22,000	4,840		27,000
Assistant electrician	day	16,500	3,630		20,000
Reinforcement worker	day	22,000	4,840		27,000
Welder	day	22,000	4,840		27,000
Rigger	day	27,500	6,050		34,000
Plumber	day	22,000	4,840	5,500	32,000
Plasterer	day	27,500	6,050		34,000
Concrete worker	day	22,000	4,840		27,000
Form worker	day	23,500	5,170		29,000
Carpenter	day	22,000	4,840		27,000
Pavement worker	day	27,500	6,050		34,000
Mason	day	22,000	4,840		27,000
Stone worker	day	22,000	4,840		27,000
Steel worker, steel structure	day	22,000	4,840		27,000
Pipe fitter	day	22,000	4,840		27,000
Concrete block/brick worker	day	22,000	4,840		27,000
Supervisory/Office Personnel (Monthly basis					
(A) : 20 years, (B) : 15 years, (C) : 10 years					
Civil engineer (A)	month	5,000,000	1,100,000		6,100,000
Civil engineer (B)	month	3,500,000	770,000		4,270,000
Civil engineer (C)	month	2,880,000	633,600		3,514,000
Pipe engineer (A), for water supply system	month	5,000,000	1,100,000		6,100,000
Pipe engineer (B), for water supply system	month	3,500,000	770,000		4,270,000
Building engineer (A)	month	5,000,000	1,100,000		6,100,000
Building engineer (B)	month	4,000,000	880,000		4,880,000
Survey engineer	month	2,400,000	528,000		2,928,000
Assistant surveyor	month	1,000,000	220,000		1,220,000
Computer operator	month	1,800,000	396,000		2,196,000
Administrator officer	month	2,000,000	440,000		2,440,000
Secretary	month	1,200,000	264,000		1,464,000

Remarks:

- Project site and area: Nusa Tenggara Barat and Nusa Tenggara Timur
- Surcharge(*1) of 22% consists of overtime allowance for 2 hours on Saturday (10%) and insurance to be borne by employer (12%).
- Surcharge(*2) is provided for the skilled workers that would be employed much in number from Java.
- Price level: Oct. 2001
- Exchange rate:
  US$ 1.0 = Rp.10,435
  US$ 1.0 = J. Yen 121.92
  J. Yen 1.0 = Rp.85.59

Table A12-2.2 Unit Price of Major Construction Materials

Materials	Specifications	Unit	Unit price (Rp.)
Portland cement		ton	540,000
Reinforcing bar	deformed, D10 -D13	ton	5,750,000
Reinforcing bar	deformed, D16 - D22	ton	5,750,000
Structural steel	Steel plate, H-beam, etc.	ton	45,000,000
Timber, plank		m3	2,650,000
Timber, square		m3	2,500,000
Timber log		m3	2,500,000
Plywood	t=12mm	m3	2,500,000
Form oil		liter	15,750
uPVC pipe	dia.=25mm, L=6m	Nr.	25,000
uPVC pipe	dia.=50mm, L=6m	Nr.	70,500
uPVC pipe	dia.=75mm, L=6m	Nr.	129,000
uPVC pipe	dia.=100mm, L=6m	Nr.	188,500
uPVC pipe	dia.=150mm, L=6m	Nr.	394,000
GS pipe	dia.=25mm, L=6m	Nr.	105,000
GS pipe	dia.=50mm, L=6m	Nr.	195,000
GS pipe	dia.=75mm, L=6m	Nr.	325,000
GS pipe	dia.=100mm, L=6m	Nr.	475,000
GS pipe	dia.=150mm, L=6m	Nr.	725,000
FRP tank	3 m3	Nr.	25,500
Faucet	dia. = 25mm	Nr.	20,000
Calcium hypochlorite (powder)	for disinfecting water	kg	12,000
Brick		Nr.	150
Sand		m3	30,000
Gravel,		m3	30,000
Cobble/boulder		m3	32,500
Gasoline		liter	1,500
Light oil (diesel, fuel)		liter	900

Remarks :

- Project site and area: Nusa Tenggara Barat and Nusa Tenggara Timur.
- Sand, sravel and stone are puchased close to the villages.
- Material price excludes VAT.
- Price level: Oct. 2001
- Exchange rate:
  US$ 1.0 = Rp.10,435
  US$ 1.0 = J. Yen 121.92
  J. Yen 1.0 = Rp.85.59

Table A12-2.3 Daily/hourly Cost of Major Construction Equipment

Code	Equipment	Unit	Fuel	Engine capacity (PS/kW)	Hourly/daily cost F.C (Yen)	L.C (Rp.)	Total (Rp.)
E010115	Bulldozer, 11t	hr	Light oil	100	0	224,205	224,205
E010116	Bulldozer, 15t	hr	Light oil	141	0	297,427	297,427
E010117	Bulldozer, 21t	hr	Light oil	207	0	492,400	492,400
E020212	Backhoe, 0.35m3	hr	Light oil	75	0	151,128	151,128
E020215	Backhoe, 0.6m3	hr	Light oil	126	0	227,380	227,380
E030105	Dump truck,11t	hr	Light oil	335	0	71,758	71,758
E030224	Truck-bed crane, 4t, 2.9t	hr	Light oil	180	0	99,967	99,967
E040226	Truck crane, hyd., 30t	hr	Light oil	286	0	467,504	467,504
E080712	Vibratory compactor, 70-80kg	day	Gasoline	4	0	42,053	42,053

Note: - Price level: October, 2001
- Exchange rate: US$1.0= Yen 121.92
Exchange rate: US$1.0= Rp. 10,435
Exchange rate: Yen1.0= Rp. 85.59

Table A12-2.4 Estimated Unit Rates of Construction Works

Work items	Unit	Rate	
		F.C.(Y)	L.C (Rp.)
1. Intake facilities			
1) Intake facilities			
/10 Tappimg works from existing water system	Nr.	0	3,618,000
/20 Spring water intake	Nr.	0	2,222,000
/30 Tube well	Nr.	0	282,181,000
/40 Shallow well	Nr.	0	41,835,000
/50 Cave water intake	Nr.	0	3,866,000
2) Pumps			
/10 Submersible	Nr.	0	203,500,000
/20 Surface Centri-fugal	Nr.	0	46,924,000
2. Transmission and Distribution ma			
1) Pipeline exca. Inst. Backfill.			
/10 Pipeline dia. 150 mm	m	0	166,900
/20 Pipeline dia. 100 mm	m	0	100,500
/30 Pipeline dia. 75 mm	m	0	76,300
/40 Pipeline dia. 50 mm	m	0	53,500
2) Asphalt Pavement			
/10 Pipeline dia. 150 mm	m	0	16,100
/20 Pipeline dia. 100 mm	m	0	16,100
/30 Pipeline dia. 75 mm	m	0	16,100
/40 Pipeline dia. 50 mm	m	0	16,100
3. Stream/River crossing			
1) Bridge (L>15m)	Nr.	0	10,704,100
2) Bridge (L<15m)	Nr.	0	4,733,300
4. Distribution networl			
1) Ground reservoir	Nr.	0	22,547,000
2) Cholorinator	Nr.	0	2,184,000
3) Service pipeline			
/10 Pipeline dia. 75 mm	m	0	76,300
/20 Pipeline dia. 50 mm	m	0	53,500
/30 Pipeline dia. 25 mm	m	0	35,500
4) Asphalt Pavement			
/10 Pipeline dia. 75 mm	m	0	16,100
/20 Pipeline dia. 50 mm	m	0	16,100
/30 Pipeline dia. 25 mm	m	0	16,100
5) Pulic hydrant	Nr.	0	5,189,000
6) Pulic taps	Nr.	0	2,061,000
7) House conection	Nr.	0	1,550,000

Note: - Price level; Oct. 2001
- Exchange rate:
US$ 1.0 = Rp.10,435
US$ 1.0 = J. Yen 121.92
J. Yen 1.0 = Rp.85.59

Table A12-3.1 (Plan 1) Breakdown of Construction Cost by Phase (1/2)

Construction works / Phase1 (NTB)

Works Items	Unit	Q'ty	Rate F.C.(Y)	Rate L.C (Rp.)	Amount F.C.(Y)	Amount L.C (Rp.)	Total (Y)
1. Site preparation and expenses					37,610,000	1,176,906,000	51,360,508
2. Intake facilities							
1) Intake facilities							
/10 Tappimg works from existing water system	Nr.	4	0	3,618,000	0	14,472,000	169,085
/20 Spring water intake	Nr.	5	0	2,222,000	0	11,110,000	129,805
/30 Tube well	Nr.	2	0	282,181,000	0	564,362,000	6,593,784
/40 Shallow well	Nr.	1	0	41,835,000	0	41,835,000	488,784
/50 Cave water intake	Nr.	0	0	3,866,000	0	0	0
2) Pumps							
/10 Submersible	Nr.	3	0	203,500,000	0	610,500,000	7,132,843
/20 Surface Centri-fugal	Nr.	0	0	46,924,000	0	0	0
Sub-total for 2.					**0**	**1,242,279,000**	**14,514,301**
3. Transmission and Distribution main							
1) Pipeline exca. Inst. Backfill.							
/10 Pipeline dia. 150 mm	m	800	0	166,900	0	133,520,000	1,559,995
/20 Pipeline dia. 100 mm	m	6,520	0	100,500	0	655,260,000	7,655,801
/30 Pipeline dia. 75 mm	m	8,135	0	76,300	0	620,700,500	7,252,021
/40 Pipeline dia. 50 mm	m	2,520	0	53,500	0	134,820,000	1,575,184
2) Asphalt Pavement							
/10 Pipeline dia. 150 mm 75%	m	600	0	16,100	0	9,660,000	112,864
/20 Pipeline dia. 100 mm 75%	m	4,890	0	16,100	0	78,729,000	919,839
/30 Pipeline dia. 75 mm 75%	m	6,101	0	16,100	0	98,230,125	1,147,682
/40 Pipeline dia. 50 mm 75%	m	1,890	0	16,100	0	30,429,000	355,521
Sub-total for 3.					**0**	**1,761,348,625**	**20,578,907**
4. Stream/River crossing							
1) Bridge (L>15m)	Nr.	6	0	10,704,100	0	64,224,600	750,375
2) Bridge (L<15m)	Nr.	12	0	4,733,300	0	56,799,600	663,624
Sub-total for 4.					**0**	**121,024,200**	**1,413,999**
5. Distribution network							
1) Ground reservoir	Nr.	11	0	22,547,000	0	248,017,000	2,897,733
2) Cholorinator	Nr.	9	0	2,184,000	0	19,656,000	229,653
3) Service pipeline							
/10 Pipeline dia. 75 mm	m	7,130	0	76,300	0	544,019,000	6,356,105
/20 Pipeline dia. 50 mm	m	22,088	0	53,500	0	1,181,708,000	13,806,613
/30 Pipeline dia. 25 mm	m	56,110	0	35,500	0	1,991,905,000	23,272,637
4) Asphalt Pavement							
/10 Pipeline dia. 75 mm 75%	m	5,348	0	16,100	0	86,094,750	1,005,897
/20 Pipeline dia. 50 mm 75%	m	16,566	0	16,100	0	266,712,600	3,116,165
/30 Pipeline dia. 25 mm 75%	m	42,083	0	16,100	0	677,528,250	7,915,974
5) Pulic hydrant	Nr.	215	0	5,189,000	0	1,115,635,000	13,034,642
6) Pulic taps	Nr.	82	0	2,061,000	0	169,002,000	1,974,553
7) House conection	Nr.	2,437	0	1,550,000	0	3,777,350,000	44,133,076
8) Service meter	Nr.	2,014	0	0	0	0	0
Sub-total for 5.					**0**	**10,077,627,600**	**117,743,049**
Total of 1.-5.					**37,610,000**	**14,379,185,425**	**205,610,764**
6. Physical Contingency 15% of total 1. -4.			15%	15%	5,641,500	2,156,877,814	30,841,615
Total of 1.-6.					**43,251,500**	**16,536,063,239**	236,452,379
7. Price Contingency			1%	24%	432,515	3,968,655,177	46,800,726
Total of 1.-7.					**43,684,015**	**20,504,718,416**	**283,253,105**

Note: - Price level; Oct. 2001
- Exchange rate:
US$ 1.0 = Rp.10,435
US$ 1.0 = J. Yen 121.92
J. Yen 1.0 = Rp.85.59

Phase 1 (NTB)	43,684,015	20,504,718,416	283,253,106
Phase 2 (NTT)	46,668,978	15,372,724,751	226,277,867
	90,352,993	35,877,443,167	509,530,972

Table A12-3.1 (Plan 1) Breakdown of Construction Cost by Phase (2/2)

Construction works / Phase2 (NTT)

Works Items	Unit	Q'ty	Rate F.C.(Y)	Rate L.C (Rp.)	Amount F.C.(Y)	Amount L.C (Rp.)	Total (Y)
1. Site preparation and expenses					39,786,000	1,569,986,600	58,129,108
2. Intake facilities							
1) Intake facilities							
/10 Tappimg works from existing water system	Nr.	0	0	3,618,000	0	0	0
/20 Spring water intake	Nr.	4	0	2,222,000	0	8,888,000	103,844
/30 Tube well	Nr.	0	0	282,181,000	0	0	0
/40 Shallow well	Nr.	0	0	41,835,000	0	0	0
/50 Cave water intake	Nr.	2	0	3,866,000	0	7,732,000	90,338
2) Pumps							
/10 Submersible	Nr.	2	0	203,500,000	0	407,000,000	4,755,228
/20 Surface Centri-fugal	Nr.	11	0	46,924,000	0	516,164,000	6,030,658
Sub-total for 1.					**0**	**939,784,000**	**10,980,068**
3. Transmission and Distribution main							
1) Pipeline exca. Inst. Backfill.							
/10 Pipeline dia. 150 mm	m	0	0	166,900	0	0	0
/20 Pipeline dia. 100 mm	m	7,200	0	100,500	0	723,600,000	8,454,259
/30 Pipeline dia. 75 mm	m	6,045	0	76,300	0	461,233,500	5,388,871
/40 Pipeline dia. 50 mm	m	5,525	0	53,500	0	295,587,500	3,453,528
2) Asphalt Pavement							
/10 Pipeline dia. 150 mm 75%	m	0	0	16,100	0	0	0
/20 Pipeline dia. 100 mm 75%	m	5,400	0	16,100	0	86,940,000	1,015,773
/30 Pipeline dia. 75 mm 75%	m	4,534	0	16,100	0	72,993,375	852,826
/40 Pipeline dia. 50 mm 75%	m	4,144	0	16,100	0	66,714,375	779,465
Sub-total for 3.					**0**	**1,707,068,750**	**19,944,722**
4. Stream/River crossing							
1) Bridge (L>15m)	Nr.	3	0	10,704,100	0	32,112,300	375,188
2) Bridge (L<15m)	Nr.	7	0	4,733,300	0	33,133,100	387,114
Sub-total for 4.					**0**	**65,245,400**	**762,302**
5. Distribution network							
1) Ground reservoir	Nr.	9	0	22,547,000	0	202,923,000	2,370,873
2) Cholorinator	Nr.	14	0	2,184,000	0	30,576,000	357,238
3) Service pipeline							
/10 Pipeline dia. 75 mm	m	1,520	0	76,300	0	115,976,000	1,355,018
/20 Pipeline dia. 50 mm	m	19,880	0	53,500	0	1,063,580,000	12,426,452
/30 Pipeline dia. 25 mm	m	29,670	0	35,500	0	1,053,285,000	12,306,169
4) Asphalt Pavement							
/10 Pipeline dia. 75 mm 75%	m	1,140	0	16,100	0	18,354,000	214,441
/20 Pipeline dia. 50 mm 75%	m	14,910	0	16,100	0	240,051,000	2,804,662
/30 Pipeline dia. 25 mm 75%	m	22,253	0	16,100	0	358,265,250	4,185,831
5) Pulic hydrant	Nr.	64	0	5,189,000	0	332,096,000	3,880,079
6) Pulic taps	Nr.	70	0	2,061,000	0	144,270,000	1,685,594
7) House conection	Nr.	1,377	0	1,550,000	0	2,134,350,000	24,936,909
8) Service meter	Nr.	1,083	0	0	0	0	0
Sub-total for 5.					**0**	**5,693,726,250**	**66,523,265**
Total of 1.-5.					**39,786,000**	**9,975,811,000**	**156,339,464**
6. Physical Contingency 15% of total 1. -4.			15%	15%	5,967,900	1,496,371,650	23,450,920
Total of 1.-6.					**45,753,900**	**11,472,182,650**	179,790,384
7. Price Contingency			2%	34%	915,078	3,900,542,101	46,487,482
Total of 1.-7.					**46,668,978**	**15,372,724,751**	**226,277,866**

Note: - Price level; Oct. 2001
- Exchange rate:
US$ 1.0 = Rp.10,435
US$ 1.0 = J. Yen 121.92
J. Yen 1.0 = Rp.85.59

Phase 1 (NTB)	43,684,015	20,504,718,416	283,253,106
Phase 2 (NTT)	46,668,978	15,372,724,751	226,277,867
	90,352,993	35,877,443,167	509,530,972

Table A12-3.2 (Plan 2) Breakdown of Construction Cost by Phase (1/2)

Construction works / Phase 1

Works Items	Unit	Q'ty	Rate F.C.(Y)	Rate L.C (Rp.)	Amount F.C.(Y)	Amount L.C (Rp.)	Total (Y)
1. Site preparation and expenses					37,610,000	1,185,956,000	51,466,245
2. Intake facilities							
1) Intake facilities							
/10 Tappimg works from existing water system	Nr.	4	0	3,618,000	0	14,472,000	169,085
/20 Spring water intake	Nr.	5	0	2,222,000	0	11,110,000	129,805
/30 Tube well	Nr.	0	0	282,181,000	0	0	0
/40 Shallow well	Nr.	0	0	41,835,000	0	0	0
/50 Cave water intake	Nr.	1	0	3,866,000	0	3,866,000	45,169
2) Pumps							
/10 Submersible	Nr.	0	0	203,500,000	0	0	0
/20 Surface Centri-fugal	Nr.	5	0	46,924,000	0	234,620,000	2,741,208
Sub-total for 2.					**0**	**264,068,000**	**3,085,267**
3. Transmission and Distribution main							
1) Pipeline exca. Inst. Backfill.							
/10 Pipeline dia. 150 mm	m	800	0	166,900	0	133,520,000	1,559,995
/20 Pipeline dia. 100 mm	m	7,220	0	100,500	0	725,610,000	8,477,743
/30 Pipeline dia. 75 mm	m	9,865	0	76,300	0	752,699,500	8,794,246
/40 Pipeline dia. 50 mm	m	3,030	0	53,500	0	162,105,000	1,893,971
2) Asphalt Pavement							
/10 Pipeline dia. 150 mm 75%	m	600	0	16,100	0	9,660,000	112,864
/20 Pipeline dia. 100 mm 75%	m	5,415	0	16,100	0	87,181,500	1,018,594
/30 Pipeline dia. 75 mm 75%	m	7,399	0	16,100	0	119,119,875	1,391,750
/40 Pipeline dia. 50 mm 75%	m	2,273	0	16,100	0	36,587,250	427,471
Sub-total for 3.					**0**	**2,026,483,125**	**23,676,634**
4. Stream/River crossing							
1) Bridge (L>15m)	Nr.	6	0	10,704,100	0	64,224,600	750,375
2) Bridge (L<15m)	Nr.	12	0	4,733,300	0	56,799,600	663,624
Sub-total for 4.					**0**	**121,024,200**	**1,413,999**
5. Distribution network							
1) Ground reservoir	Nr.	15	0	22,547,000	0	338,205,000	3,951,455
2) Cholorinator	Nr.	14	0	2,184,000	0	30,576,000	357,238
3) Service pipeline							
/10 Pipeline dia. 75 mm	m	5,780	0	76,300	0	441,014,000	5,152,635
/20 Pipeline dia. 50 mm	m	26,238	0	53,500	0	1,403,733,000	16,400,666
/30 Pipeline dia. 25 mm	m	49,000	0	35,500	0	1,739,500,000	20,323,636
4) Asphalt Pavement							
/10 Pipeline dia. 75 mm 75%	m	4,335	0	16,100	0	69,793,500	815,440
/20 Pipeline dia. 50 mm 75%	m	19,679	0	16,100	0	316,823,850	3,701,646
/30 Pipeline dia. 25 mm 75%	m	36,750	0	16,100	0	591,675,000	6,912,899
5) Pulic hydrant	Nr.	193	0	5,189,000	0	1,001,477,000	11,700,865
6) Pulic taps	Nr.	100	0	2,061,000	0	206,100,000	2,407,992
7) House conection	Nr.	2,062	0	1,550,000	0	3,196,100,000	37,341,979
8) Service meter	Nr.	1,984	0	0	0	0	0
Sub-total for 5.					**0**	**9,334,997,350**	**109,066,449**
Total of 1.-5.					**37,610,000**	**12,932,528,675**	**188,708,594**
6. Physical Contingency 15% of total 1. -4.			15%	15%	5,641,500	1,939,879,301	28,306,289
Total of 1.-6.					**43,251,500**	**14,872,407,976**	217,014,883
7. Price Contingency			1%	24%	432,515	3,569,377,914	42,135,727
Total of 1.-7.					**43,684,015**	**18,441,785,890**	**259,150,610**

Note: - Price level; Oct. 2001
- Exchange rate:
US$ 1.0 = Rp.10,435
US$ 1.0 = J. Yen 121.92
J. Yen 1.0 = Rp.85.59

Phase 1	43,684,015	18,441,785,890	259,150,611
Phase 2	46,668,978	17,836,167,275	255,059,763
	90,352,993	36,277,953,165	514,210,374

Table A12-3.2 (Plan 2) Breakdown of Construction Cost by Phase (2/2)

Construction works / Phase 2

Works Items	Unit	Q'ty	Rate F.C.(Y)	Rate L.C (Rp.)	Amount F.C.(Y)	Amount L.C (Rp.)	Total (Y)
1. Site preparation and expenses					39,786,000	1,712,879,800	59,798,616
2. Intake facilities							
1) Intake facilities							
/10 Tappimg works from existing water system	Nr.	0	0	3,618,000	0	0	0
/20 Spring water intake	Nr.	4	0	2,222,000	0	8,888,000	103,844
/30 Tube well	Nr.	2	0	282,181,000	0	564,362,000	6,593,784
/40 Shallow well	Nr.	1	0	41,835,000	0	41,835,000	488,784
/50 Cave water intake	Nr.	1	0	3,866,000	0	3,866,000	45,169
2) Pumps							
/10 Submersible	Nr.	5	0	203,500,000	0	1,017,500,000	11,888,071
/20 Surface Centri-fugal	Nr.	6	0	46,924,000	0	281,544,000	3,289,450
Sub-total for 1.					**0**	**1,917,995,000**	**22,409,102**
3. Transmission and Distribution main							
1) Pipeline exca. Inst. Backfill.							
/10 Pipeline dia. 150 mm	m	0	0	166,900	0	0	0
/20 Pipeline dia. 100 mm	m	6,500	0	100,500	0	653,250,000	7,632,317
/30 Pipeline dia. 75 mm	m	4,315	0	76,300	0	329,234,500	3,846,647
/40 Pipeline dia. 50 mm	m	5,015	0	53,500	0	268,302,500	3,134,741
2) Asphalt Pavement							
/10 Pipeline dia. 150 mm 75%	m	0	0	16,100	0	0	0
/20 Pipeline dia. 100 mm 75%	m	4,875	0	16,100	0	78,487,500	917,017
/30 Pipeline dia. 75 mm 75%	m	3,236	0	16,100	0	52,103,625	608,758
/40 Pipeline dia. 50 mm 75%	m	3,761	0	16,100	0	60,556,125	707,514
Sub-total for 3.					**0**	**1,441,934,250**	**16,846,994**
4. Stream/River crossing							
1) Bridge (L>15m)	Nr.	3	0	10,704,100	0	32,112,300	375,188
2) Bridge (L<15m)	Nr.	7	0	4,733,300	0	33,133,100	387,114
Sub-total for 4.					**0**	**65,245,400**	**762,302**
5. Distribution network							
1) Ground reservoir	Nr.	5	0	22,547,000	0	112,735,000	1,317,152
2) Cholorinator	Nr.	9	0	2,184,000	0	19,656,000	229,653
3) Service pipeline							
/10 Pipeline dia. 75 mm	m	2,870	0	76,300	0	218,981,000	2,558,488
/20 Pipeline dia. 50 mm	m	15,730	0	53,500	0	841,555,000	9,832,399
/30 Pipeline dia. 25 mm	m	36,780	0	35,500	0	1,305,690,000	15,255,170
4) Asphalt Pavement							
/10 Pipeline dia. 75 mm 75%	m	2,153	0	16,100	0	34,655,250	404,898
/20 Pipeline dia. 50 mm 75%	m	11,798	0	16,100	0	189,939,750	2,219,182
/30 Pipeline dia. 25 mm 75%	m	27,585	0	16,100	0	444,118,500	5,188,906
5) Pulic hydrant	Nr.	86	0	5,189,000	0	446,254,000	5,213,857
6) Pulic taps	Nr.	52	0	2,061,000	0	107,172,000	1,252,156
7) House conection	Nr.	1,752	0	1,550,000	0	2,715,600,000	31,728,006
8) Service meter	Nr.	1,113	0	0	0	0	0
Sub-total for 5.					**0**	**6,436,356,500**	**75,199,866**
Total of 1.-5.					**39,786,000**	**11,574,410,950**	**175,016,879**
6. Physical Contingency 15% of total 1. -4.			15%	15%	5,967,900	1,736,161,643	26,252,532
Total of 1.-6.					**45,753,900**	**13,310,572,593**	201,269,411
7. Price Contingency			2%	34%	915,078	4,525,594,682	53,790,352
Total of 1.-7.					**46,668,978**	**17,836,167,275**	**255,059,763**

Note: - Price level; Oct. 2001
- Exchange rate:
US$ 1.0 = Rp.10,435
US$ 1.0 = J. Yen 121.92
J. Yen 1.0 = Rp.85.59

Phase 1	43,684,015	18,441,785,890	259,150,611
Phase 2	46,668,978	17,836,167,275	255,059,763
	90,352,993	36,277,953,165	514,210,374

Table A12-3.3 Breakdown of Construction Cost by Village (1/19)

Construction works / Kuranji (NTB 1)

Works Items	Unit	Q'ty	Rate F.C.(Y)	Rate L.C (Rp.)	Amount F.C.(Y)	Amount L.C (Rp.)	Total (Y)
1. Intake facilities							
1) Intake facilities							
/10 Tappimg works from existing water system	Nr.	1	0	3,618,000	0	3,618,000	42,271
/20 Spring water intake	Nr.	0	0	2,222,000	0	0	0
/30 Tube well	Nr.	0	0	282,181,000	0	0	0
/40 Shallow well	Nr.	0	0	41,835,000	0	0	0
/50 Cave water intake	Nr.	0	0	3,866,000	0	0	0
2) Pumps							
/10 Submersible	Nr.	0	0	203,500,000	0	0	0
/20 Surface Centri-fugal	Nr.	0	0	46,924,000	0	0	0
Sub-total for 1.					**0**	**3,618,000**	**42,271**
2. Transmission and Distribution main							
1) Pipeline exca. Inst. Backfill.							
/10 Pipeline dia. 150 mm	m	0	0	166,900	0	0	0
/20 Pipeline dia. 100 mm	m	0	0	100,500	0	0	0
/30 Pipeline dia. 75 mm	m	360	0	76,300	0	27,468,000	320,925
/40 Pipeline dia. 50 mm	m	0	0	53,500	0	0	0
2) Asphalt Pavement							
/10 Pipeline dia. 150 mm 75%	m	0	0	16,100	0	0	0
/20 Pipeline dia. 100 mm 75%	m	0	0	16,100	0	0	0
/30 Pipeline dia. 75 mm 75%	m	270	0	16,100	0	4,347,000	50,789
/40 Pipeline dia. 50 mm 75%	m	0	0	16,100	0	0	0
Sub-total for 2.					**0**	**31,815,000**	**371,714**
3. Stream/River crossing							
1) Bridge (L>15m)	Nr.	0	0	10,704,100	0	0	0
2) Bridge (L<15m)	Nr.	1	0	4,733,300	0	4,733,300	55,302
Sub-total for 3.					**0**	**4,733,300**	**55,302**
4. Distribution network							
1) Ground reservoir	Nr.	0	0	22,547,000	0	0	0
2) Cholorinator		0	0	2,184,000	0	0	0
3) Service pipeline							
/10 Pipeline dia. 75 mm	m	1,560	0	76,300	0	119,028,000	1,390,676
/20 Pipeline dia. 50 mm	m	1,380	0	53,500	0	73,830,000	862,601
/30 Pipeline dia. 25 mm	m	2,720	0	35,500	0	96,560,000	1,128,169
4) Asphalt Pavement							
/10 Pipeline dia. 75 mm 75%	m	1,170	0	16,100	0	18,837,000	220,084
/20 Pipeline dia. 50 mm 75%	m	1,035	0	16,100	0	16,663,500	194,690
/30 Pipeline dia. 25 mm 75%	m	2,040	0	16,100	0	32,844,000	383,736
5) Pulic hydrant	Nr.	17	0	5,189,000	0	88,213,000	1,030,646
6) Pulic taps	Nr.	10	0	2,061,000	0	20,610,000	240,799
7) House conection	Nr.	114	0	1,550,000	0	176,700,000	2,064,494
8) Service meter	Nr.	141	0	0	0	0	0
Sub-total for 4.					**0**	**643,285,500**	**7,515,896**
Total of 1. - 4.					**0**	**683,451,800**	**7,985,183**

Note: - Price level; Oct. 2001
- Exchange rate:
US$ 1.0 = Rp.10,435
US$ 1.0 = J. Yen 121.92
J. Yen 1.0 = Rp.85.59

Table A12-3.3 Breakdown of Construction Cost by Village (2/19)

Construction works / Bajur (NTB 2)

Works Items	Unit	Q'ty	Rate F.C.(Y)	Rate L.C (Rp.)	Amount F.C.(Y)	Amount L.C (Rp.)	Total (Y)
1. Intake facilities							
1) Intake facilities							
/10 Tappimg works from existing water system	Nr.	1	0	3,618,000	0	3,618,000	42,271
/20 Spring water intake	Nr.	0	0	2,222,000	0	0	0
/30 Tube well	Nr.	0	0	282,181,000	0	0	0
/40 Shallow well	Nr.	0	0	41,835,000	0	0	0
/50 Cave water intake	Nr.	0	0	3,866,000	0	0	0
2) Pumps							
/10 Submersible	Nr.	0	0	203,500,000	0	0	0
/20 Surface Centri-fugal	Nr.	0	0	46,924,000	0	0	0
Sub-total for 1.					**0**	**3,618,000**	**42,271**
2. Transmission and Distribution main							
1) Pipeline exca. Inst. Backfill.							
/10 Pipeline dia. 150 mm	m	0	0	166,900	0	0	0
/20 Pipeline dia. 100 mm	m	580	0	100,500	0	58,290,000	681,038
/30 Pipeline dia. 75 mm	m	0	0	76,300	0	0	0
/40 Pipeline dia. 50 mm	m	0	0	53,500	0	0	0
2) Asphalt Pavement							
/10 Pipeline dia. 150 mm 75%	m	0	0	16,100	0	0	0
/20 Pipeline dia. 100 mm 75%	m	435	0	16,100	0	7,003,500	81,826
/30 Pipeline dia. 75 mm 75%	m	0	0	16,100	0	0	0
/40 Pipeline dia. 50 mm 75%	m	0	0	16,100	0	0	0
Sub-total for 2.					**0**	**65,293,500**	**762,864**
3. Stream/River crossing							
1) Bridge (L>15m)	Nr.	0	0	10,704,100	0	0	0
2) Bridge (L<15m)	Nr.	3	0	4,733,300	0	14,199,900	165,906
Sub-total for 3.					**0**	**14,199,900**	**165,906**
4. Distribution network							
1) Ground reservoir	Nr.	0	0	22,547,000	0	0	0
2) Cholorinator		0	0	2,184,000	0	0	0
3) Service pipeline							
/10 Pipeline dia. 75 mm	m	440	0	76,300	0	33,572,000	392,242
/20 Pipeline dia. 50 mm	m	2,403	0	53,500	0	128,560,500	1,502,050
/30 Pipeline dia. 25 mm	m	10,650	0	35,500	0	378,075,000	4,417,280
4) Asphalt Pavement							
/10 Pipeline dia. 75 mm 75%	m	330	0	16,100	0	5,313,000	62,075
/20 Pipeline dia. 50 mm 75%	m	1,802	0	16,100	0	29,016,225	339,014
/30 Pipeline dia. 25 mm 75%	m	7,988	0	16,100	0	128,598,750	1,502,497
5) Pulic hydrant	Nr.	35	0	5,189,000	0	181,615,000	2,121,918
6) Pulic taps	Nr.	15	0	2,061,000	0	30,915,000	361,199
7) House conection	Nr.	490	0	1,550,000	0	759,500,000	8,873,700
8) Service meter	Nr.	540	0	0	0	0	0
Sub-total for 4.					**0**	**1,675,165,475**	**19,571,977**
Total of 1. - 4.					**0**	**1,758,276,875**	**20,543,018**

Note: - Price level; Oct. 2001
- Exchange rate:
US$ 1.0 = Rp.10,435
US$ 1.0 = J. Yen 121.92
J. Yen 1.0 = Rp.85.59

Table A12-3.3 Breakdown of Construction Cost by Village (3/19)

Construction works / Sembung (NTB 3)

Works Items		Unit	Q'ty	Rate F.C.(Y)	Rate L.C (Rp.)	Amount F.C.(Y)	Amount L.C (Rp.)	Total (Y)
1. Intake facilities								
1) Intake facilities								
/10 Tappimg works from existing water system		Nr.	1	0	3,618,000	0	3,618,000	42,271
/20 Spring water intake		Nr.	0	0	2,222,000	0	0	0
/30 Tube well		Nr.	0	0	282,181,000	0	0	0
/40 Shallow well		Nr.	0	0	41,835,000	0	0	0
/50 Cave water intake		Nr.	0	0	3,866,000	0	0	0
2) Pumps								
/10 Submersible		Nr.	0	0	203,500,000	0	0	0
/20 Surface Centri-fugal		Nr.	0	0	46,924,000	0	0	0
Sub-total for 1.						**0**	**3,618,000**	**42,271**
2. Transmission and Distribution main								
1) Pipeline exca. Inst. Backfill.								
/10 Pipeline dia. 150 mm		m	0	0	166,900	0	0	0
/20 Pipeline dia. 100 mm		m	0	0	100,500	0	0	0
/30 Pipeline dia. 75 mm		m	500	0	76,300	0	38,150,000	445,730
/40 Pipeline dia. 50 mm		m	0	0	53,500	0	0	0
2) Asphalt Pavement								
/10 Pipeline dia. 150 mm	75%	m	0	0	16,100	0	0	0
/20 Pipeline dia. 100 mm	75%	m	0	0	16,100	0	0	0
/30 Pipeline dia. 75 mm	75%	m	375	0	16,100	0	6,037,500	70,540
/40 Pipeline dia. 50 mm	75%	m	0	0	16,100	0	0	0
Sub-total for 2.						**0**	**44,187,500**	**516,269**
3. Stream/River crossing								
1) Bridge (L>15m)		Nr.	0	0	10,704,100	0	0	0
2) Bridge (L<15m)		Nr.	2	0	4,733,300	0	9,466,600	110,604
Sub-total for 3.						**0**	**9,466,600**	**110,604**
4. Distribution network								
1) Ground reservoir		Nr.	0	0	22,547,000	0	0	0
2) Cholorinator			0	0	2,184,000	0	0	0
3) Service pipeline								
/10 Pipeline dia. 75 mm		m	1,250	0	76,300	0	95,375,000	1,114,324
/20 Pipeline dia. 50 mm		m	1,140	0	53,500	0	60,990,000	712,583
/30 Pipeline dia. 25 mm		m	3,120	0	35,500	0	110,760,000	1,294,076
4) Asphalt Pavement								
/10 Pipeline dia. 75 mm	75%	m	938	0	16,100	0	15,093,750	176,349
/20 Pipeline dia. 50 mm	75%	m	855	0	16,100	0	13,765,500	160,831
/30 Pipeline dia. 25 mm	75%	m	2,340	0	16,100	0	37,674,000	440,168
5) Pulic hydrant		Nr.	17	0	5,189,000	0	88,213,000	1,030,646
6) Pulic taps		Nr.	10	0	2,061,000	0	20,610,000	240,799
7) House conection		Nr.	134	0	1,550,000	0	207,700,000	2,426,685
8) Service meter		Nr.	161	0	0	0	0	0
Sub-total for 4.						**0**	**650,181,250**	**7,596,463**
Total of 1. - 4.						**0**	**707,453,350**	**8,265,608**

Note: - Price level; Oct. 2001
- Exchange rate:
US$ 1.0 = Rp.10,435
US$ 1.0 = J. Yen 121.92
J. Yen 1.0 = Rp.85.59

Table A12-3.3 Breakdown of Construction Cost by Village (4/19)

Construction works / Duman (NTB 4-a)

Works Items	Unit	Q'ty	Rate F.C.(Y)	Rate L.C (Rp.)	Amount F.C.(Y)	Amount L.C (Rp.)	Total (Y)
1. Intake facilities							
1) Intake facilities							
/10 Tappimg works from existing water system	Nr.	0	0	3,618,000	0	0	0
/20 Spring water intake	Nr.	1	0	2,222,000	0	2,222,000	25,961
/30 Tube well	Nr.	0	0	282,181,000	0	0	0
/40 Shallow well	Nr.	0	0	41,835,000	0	0	0
/50 Cave water intake	Nr.	0	0	3,866,000	0	0	0
2) Pumps							
/10 Submersible	Nr.	0	0	203,500,000	0	0	0
/20 Surface Centri-fugal	Nr.	0	0	46,924,000	0	0	0
Sub-total for 1.					**0**	**2,222,000**	**25,961**
2. Transmission and Distribution main							
1) Pipeline exca. Inst. Backfill.							
/10 Pipeline dia. 150 mm	m	0	0	166,900	0	0	0
/20 Pipeline dia. 100 mm	m	0	0	100,500	0	0	0
/30 Pipeline dia. 75 mm	m	1,650	0	76,300	0	125,895,000	1,470,908
/40 Pipeline dia. 50 mm	m	1,530	0	53,500	0	81,855,000	956,362
2) Asphalt Pavement							
/10 Pipeline dia. 150 mm 75%	m	0	0	16,100	0	0	0
/20 Pipeline dia. 100 mm 75%	m	0	0	16,100	0	0	0
/30 Pipeline dia. 75 mm 75%	m	1,238	0	16,100	0	19,923,750	232,781
/40 Pipeline dia. 50 mm 75%	m	1,148	0	16,100	0	18,474,750	215,852
Sub-total for 2.					**0**	**246,148,500**	**2,875,903**
3. Stream/River crossing							
1) Bridge (L>15m)	Nr.	0	0	10,704,100	0	0	0
2) Bridge (L<15m)	Nr.	1	0	4,733,300	0	4,733,300	55,302
Sub-total for 3.					**0**	**4,733,300**	**55,302**
4. Distribution network							
1) Ground reservoir	Nr.	6	0	22,547,000	0	135,282,000	1,580,582
2) Cholorinator		2	0	2,184,000	0	4,368,000	51,034
3) Service pipeline							
/10 Pipeline dia. 75 mm	m	0	0	76,300	0	0	0
/20 Pipeline dia. 50 mm	m	1,670	0	53,500	0	89,345,000	1,043,872
/30 Pipeline dia. 25 mm	m	5,970	0	35,500	0	211,935,000	2,476,165
4) Asphalt Pavement							
/10 Pipeline dia. 75 mm 75%	m	0	0	16,100	0	0	0
/20 Pipeline dia. 50 mm 75%	m	1,253	0	16,100	0	20,165,250	235,603
/30 Pipeline dia. 25 mm 75%	m	4,478	0	16,100	0	72,087,750	842,245
5) Pulic hydrant	Nr.	33	0	5,189,000	0	171,237,000	2,000,666
6) Pulic taps	Nr.	10	0	2,061,000	0	20,610,000	240,799
7) House conection	Nr.	123	0	1,550,000	0	190,650,000	2,227,480
8) Service meter	Nr.	0	0	0	0	0	0
Sub-total for 4.					**0**	**915,680,000**	**10,698,446**
Total of 1. - 4.					**0**	**1,168,783,800**	**13,655,612**

Note: - Price level; Oct. 2001
- Exchange rate:
US$ 1.0 = Rp.10,435
US$ 1.0 = J. Yen 121.92
J. Yen 1.0 = Rp.85.59

Table A12-3.3 Breakdown of Construction Cost by Village (5/19)

Construction works / Duman (NTB 4-b)

Works Items	Unit	Q'ty	Rate F.C.(Y)	Rate L.C (Rp.)	Amount F.C.(Y)	Amount L.C (Rp.)	Total (Y)
1. Intake facilities							
1) Intake facilities							
/10 Tappimg works from existing water system	Nr.	1	0	3,618,000	0	3,618,000	42,271
/20 Spring water intake	Nr.	0	0	2,222,000	0	0	0
/30 Tube well	Nr.	0	0	282,181,000	0	0	0
/40 Shallow well	Nr.	0	0	41,835,000	0	0	0
/50 Cave water intake	Nr.	0	0	3,866,000	0	0	0
2) Pumps							
/10 Submersible	Nr.	0	0	203,500,000	0	0	0
/20 Surface Centri-fugal	Nr.	0	0	46,924,000	0	0	0
Sub-total for 1.					**0**	**3,618,000**	**42,271**
2. Transmission and Distribution main							
1) Pipeline exca. Inst. Backfill.							
/10 Pipeline dia. 150 mm	m	0	0	166,900	0	0	0
/20 Pipeline dia. 100 mm	m	1,900	0	100,500	0	190,950,000	2,230,985
/30 Pipeline dia. 75 mm	m	0	0	76,300	0	0	0
/40 Pipeline dia. 50 mm	m	0	0	53,500	0	0	0
2) Asphalt Pavement							
/10 Pipeline dia. 150 mm 75%	m	0	0	16,100	0	0	0
/20 Pipeline dia. 100 mm 75%	m	1,425	0	16,100	0	22,942,500	268,051
/30 Pipeline dia. 75 mm 75%	m	0	0	16,100	0	0	0
/40 Pipeline dia. 50 mm 75%	m	0	0	16,100	0	0	0
Sub-total for 2.					**0**	**213,892,500**	**2,499,036**
3. Stream/River crossing							
1) Bridge (L>15m)	Nr.	2	0	10,704,100	0	21,408,200	250,125
2) Bridge (L<15m)	Nr.	2	0	4,733,300	0	9,466,600	110,604
Sub-total for 3.					**0**	**30,874,800**	**360,729**
4. Distribution network							
1) Ground reservoir	Nr.	0	0	22,547,000	0	0	0
2) Cholorinator		0	0	2,184,000	0	0	0
3) Service pipeline							
/10 Pipeline dia. 75 mm	m	2,110	0	76,300	0	160,993,000	1,880,979
/20 Pipeline dia. 50 mm	m	2,700	0	53,500	0	144,450,000	1,687,697
/30 Pipeline dia. 25 mm	m	2,780	0	35,500	0	98,690,000	1,153,055
4) Asphalt Pavement							
/10 Pipeline dia. 75 mm 75%	m	1,583	0	16,100	0	25,478,250	297,678
/20 Pipeline dia. 50 mm 75%	m	2,025	0	16,100	0	32,602,500	380,915
/30 Pipeline dia. 25 mm 75%	m	2,085	0	16,100	0	33,568,500	392,201
5) Pulic hydrant	Nr.	18	0	5,189,000	0	93,402,000	1,091,272
6) Pulic taps	Nr.	10	0	2,061,000	0	20,610,000	240,799
7) House conection	Nr.	116	0	1,550,000	0	179,800,000	2,100,713
8) Service meter	Nr.	144	0	0	0	0	0
Sub-total for 4.					**0**	**789,594,250**	**9,225,310**
Total of 1. - 4.					**0**	**1,037,979,550**	**12,127,346**

Note: - Price level; Oct. 2001
- Exchange rate:
US$ 1.0 = Rp.10,435
US$ 1.0 = J. Yen 121.92
J. Yen 1.0 = Rp.85.59

Table A12-3.3 Breakdown of Construction Cost by Village (6/19)

Construction works / Bagik Papan (NTB 10)

Works Items	Unit	Q'ty	Rate F.C.(Y)	Rate L.C (Rp.)	Amount F.C.(Y)	Amount L.C (Rp.)	Total (Y)
1. Intake facilities							
1) Intake facilities							
/10 Tappimg works from existing water system	Nr.	0	0	3,618,000	0	0	0
/20 Spring water intake	Nr.	1	0	2,222,000	0	2,222,000	25,961
/30 Tube well	Nr.	0	0	282,181,000	0	0	0
/40 Shallow well	Nr.	0	0	41,835,000	0	0	0
/50 Cave water intake	Nr.	0	0	3,866,000	0	0	0
2) Pumps							
/10 Submersible	Nr.	0	0	203,500,000	0	0	0
/20 Surface Centri-fugal	Nr.	0	0	46,924,000	0	0	0
Sub-total for 1.					**0**	**2,222,000**	**25,961**
2. Transmission and Distribution main							
1) Pipeline exca. Inst. Backfill.							
/10 Pipeline dia. 150 mm	m	0	0	166,900	0	0	0
/20 Pipeline dia. 100 mm	m	0	0	100,500	0	0	0
/30 Pipeline dia. 75 mm	m	2,435	0	76,300	0	185,790,500	2,170,703
/40 Pipeline dia. 50 mm	m	0	0	53,500	0	0	0
2) Asphalt Pavement							
/10 Pipeline dia. 150 mm 75%	m	0	0	16,100	0	0	0
/20 Pipeline dia. 100 mm 75%	m	0	0	16,100	0	0	0
/30 Pipeline dia. 75 mm 75%	m	1,826	0	16,100	0	29,402,625	343,529
/40 Pipeline dia. 50 mm 75%	m	0	0	16,100	0	0	0
Sub-total for 2.					**0**	**215,193,125**	**2,514,232**
3. Stream/River crossing							
1) Bridge (L>15m)	Nr.	1	0	10,704,100	0	10,704,100	125,063
2) Bridge (L<15m)	Nr.	0	0	4,733,300	0	0	0
Sub-total for 3.					**0**	**10,704,100**	**125,063**
4. Distribution network							
1) Ground reservoir	Nr.	1	0	22,547,000	0	22,547,000	263,430
2) Cholorinator		1	0	2,184,000	0	2,184,000	25,517
3) Service pipeline							
/10 Pipeline dia. 75 mm	m	0	0	76,300	0	0	0
/20 Pipeline dia. 50 mm	m	3,175	0	53,500	0	169,862,500	1,984,607
/30 Pipeline dia. 25 mm	m	3,190	0	35,500	0	113,245,000	1,323,110
4) Asphalt Pavement							
/10 Pipeline dia. 75 mm 75%	m	0	0	16,100	0	0	0
/20 Pipeline dia. 50 mm 75%	m	2,381	0	16,100	0	38,338,125	447,928
/30 Pipeline dia. 25 mm 75%	m	2,393	0	16,100	0	38,519,250	450,044
5) Pulic hydrant	Nr.	30	0	5,189,000	0	155,670,000	1,818,787
6) Pulic taps	Nr.	5	0	2,061,000	0	10,305,000	120,400
7) House conection	Nr.	127	0	1,550,000	0	196,850,000	2,299,918
8) Service meter	Nr.	0	0	0	0	0	0
Sub-total for 4.					**0**	**747,520,875**	**8,733,741**
Total of 1. - 4.					**0**	**975,640,100**	**11,398,996**

Note: - Price level; Oct. 2001
- Exchange rate:
US$ 1.0 = Rp.10,435
US$ 1.0 = J. Yen 121.92
J. Yen 1.0 = Rp.85.59

Table A12-3.3 Breakdown of Construction Cost by Village (7/19)

Construction works / Selaparang (NTB 11)

Works Items	Unit	Q'ty	Rate F.C.(Y)	Rate L.C (Rp.)	Amount F.C.(Y)	Amount L.C (Rp.)	Total (Y)
1. Intake facilities							
1) Intake facilities							
/10 Tappimg works from existing water system	Nr.	0	0	3,618,000	0	0	0
/20 Spring water intake	Nr.	1	0	2,222,000	0	2,222,000	25,961
/30 Tube well	Nr.	0	0	282,181,000	0	0	0
/40 Shallow well	Nr.	0	0	41,835,000	0	0	0
/50 Cave water intake	Nr.	0	0	3,866,000	0	0	0
2) Pumps							
/10 Submersible	Nr.	0	0	203,500,000	0	0	0
/20 Surface Centri-fugal	Nr.	0	0	46,924,000	0	0	0
Sub-total for 1.					**0**	**2,222,000**	**25,961**
2. Transmission and Distribution main							
1) Pipeline exca. Inst. Backfill.							
/10 Pipeline dia. 150 mm	m	800	0	166,900	0	133,520,000	1,559,995
/20 Pipeline dia. 100 mm	m	1,240	0	100,500	0	124,620,000	1,456,011
/30 Pipeline dia. 75 mm	m	2,500	0	76,300	0	190,750,000	2,228,648
/40 Pipeline dia. 50 mm	m	0	0	53,500	0	0	0
2) Asphalt Pavement							
/10 Pipeline dia. 150 mm 75%	m	600	0	16,100	0	9,660,000	112,864
/20 Pipeline dia. 100 mm 75%	m	930	0	16,100	0	14,973,000	174,939
/30 Pipeline dia. 75 mm 75%	m	1,875	0	16,100	0	30,187,500	352,699
/40 Pipeline dia. 50 mm 75%	m	0	0	16,100	0	0	0
Sub-total for 2.					**0**	**503,710,500**	**5,885,156**
3. Stream/River crossing							
1) Bridge (L>15m)	Nr.	1	0	10,704,100	0	10,704,100	125,063
2) Bridge (L<15m)	Nr.	0	0	4,733,300	0	0	0
Sub-total for 3.					**0**	**10,704,100**	**125,063**
4. Distribution network							
1) Ground reservoir	Nr.	2	0	22,547,000	0	45,094,000	526,861
2) Cholorinator		1	0	2,184,000	0	2,184,000	25,517
3) Service pipeline							
/10 Pipeline dia. 75 mm	m	420	0	76,300	0	32,046,000	374,413
/20 Pipeline dia. 50 mm	m	1,820	0	53,500	0	97,370,000	1,137,633
/30 Pipeline dia. 25 mm	m	11,380	0	35,500	0	403,990,000	4,720,061
4) Asphalt Pavement							
/10 Pipeline dia. 75 mm 75%	m	315	0	16,100	0	5,071,500	59,253
/20 Pipeline dia. 50 mm 75%	m	1,365	0	16,100	0	21,976,500	256,765
/30 Pipeline dia. 25 mm 75%	m	8,535	0	16,100	0	137,413,500	1,605,485
5) Pulic hydrant	Nr.	15	0	5,189,000	0	77,835,000	909,394
6) Pulic taps	Nr.	10	0	2,061,000	0	20,610,000	240,799
7) House conection	Nr.	549	0	1,550,000	0	850,950,000	9,942,166
8) Service meter	Nr.	574	0	0	0	0	0
Sub-total for 4.					**0**	**1,694,540,500**	**19,798,347**
Total of 1. - 4.					**0**	**2,211,177,100**	**25,834,526**

Note: - Price level; Oct. 2001
- Exchange rate:
US$ 1.0 = Rp.10,435
US$ 1.0 = J. Yen 121.92
J. Yen 1.0 = Rp.85.59

Table A12-3.3 Breakdown of Construction Cost by Village (8/19)

Construction works / Labuhan Mapin (NTB 13)

Works Items	Unit	Q'ty	Rate F.C.(Y)	Rate L.C (Rp.)	Amount F.C.(Y)	Amount L.C (Rp.)	Total (Y)
1. Intake facilities							
1) Intake facilities							
/10 Tappimg works from existing water system	Nr.	0	0	3,618,000	0	0	0
/20 Spring water intake	Nr.	1	0	2,222,000	0	2,222,000	25,961
/30 Tube well	Nr.	0	0	282,181,000	0	0	0
/40 Shallow well	Nr.	0	0	41,835,000	0	0	0
/50 Cave water intake	Nr.	0	0	3,866,000	0	0	0
2) Pumps							
/10 Submersible	Nr.	0	0	203,500,000	0	0	0
/20 Surface Centri-fugal	Nr.	0	0	46,924,000	0	0	0
Sub-total for 1.					**0**	**2,222,000**	**25,961**
2. Transmission and Distribution main							
1) Pipeline exca. Inst. Backfill.							
/10 Pipeline dia. 150 mm	m	0	0	166,900	0	0	0
/20 Pipeline dia. 100 mm	m	0	0	100,500	0	0	0
/30 Pipeline dia. 75 mm	m	0	0	76,300	0	0	0
/40 Pipeline dia. 50 mm	m	0	0	53,500	0	0	0
2) Asphalt Pavement							
/10 Pipeline dia. 150 mm 75%	m	0	0	16,100	0	0	0
/20 Pipeline dia. 100 mm 75%	m	0	0	16,100	0	0	0
/30 Pipeline dia. 75 mm 75%	m	0	0	16,100	0	0	0
/40 Pipeline dia. 50 mm 75%	m	0	0	16,100	0	0	0
Sub-total for 2.					**0**	**0**	**0**
3. Stream/River crossing							
1) Bridge (L>15m)	Nr.	0	0	10,704,100	0	0	0
2) Bridge (L<15m)	Nr.	0	0	4,733,300	0	0	0
Sub-total for 3.					**0**	**0**	**0**
4. Distribution network							
1) Ground reservoir	Nr.	0	0	22,547,000	0	0	0
2) Cholorinator		1	0	2,184,000	0	2,184,000	25,517
3) Service pipeline							
/10 Pipeline dia. 75 mm	m	0	0	76,300	0	0	0
/20 Pipeline dia. 50 mm	m	1,810	0	53,500	0	96,835,000	1,131,382
/30 Pipeline dia. 25 mm	m	8,460	0	35,500	0	300,330,000	3,508,938
4) Asphalt Pavement							
/10 Pipeline dia. 75 mm 75%	m	0	0	16,100	0	0	0
/20 Pipeline dia. 50 mm 75%	m	1,358	0	16,100	0	21,855,750	255,354
/30 Pipeline dia. 25 mm 75%	m	6,345	0	16,100	0	102,154,500	1,193,533
5) Pulic hydrant	Nr.	7	0	5,189,000	0	36,323,000	424,384
6) Pulic taps	Nr.	0	0	2,061,000	0	0	0
7) House conection	Nr.	446	0	1,550,000	0	691,300,000	8,076,878
8) Service meter	Nr.	454	0	0	0	0	0
Sub-total for 4.					**0**	**1,250,982,250**	**14,615,986**
Total of 1. - 4.					**0**	**1,253,204,250**	**14,641,947**

Note: - Price level; Oct. 2001
- Exchange rate:
US$ 1.0 = Rp.10,435
US$ 1.0 = J. Yen 121.92
J. Yen 1.0 = Rp.85.59

Table A12-3.3 Breakdown of Construction Cost by Village (9/19)

Construction works / Labuhan Lalar (NTB 14)

Works Items	Unit	Q'ty	Rate F.C.(Y)	Rate L.C (Rp.)	Amount F.C.(Y)	Amount L.C (Rp.)	Total (Y)
1. Intake facilities							
1) Intake facilities							
/10 Tappimg works from existing water system	Nr.	0	0	3,618,000	0	0	0
/20 Spring water intake	Nr.	0	0	2,222,000	0	0	0
/30 Tube well	Nr.	1	0	282,181,000	0	282,181,000	3,296,892
/40 Shallow well	Nr.	0	0	41,835,000	0	0	0
/50 Cave water intake	Nr.	0	0	3,866,000	0	0	0
2) Pumps							
/10 Submersible	Nr.	1	0	203,500,000	0	203,500,000	2,377,614
/20 Surface Centri-fugal	Nr.	0	0	46,924,000	0	0	0
Sub-total for 1.					**0**	**485,681,000**	**5,674,506**
2. Transmission and Distribution main							
1) Pipeline exca. Inst. Backfill.							
/10 Pipeline dia. 150 mm	m	0	0	166,900	0	0	0
/20 Pipeline dia. 100 mm	m	2,800	0	100,500	0	281,400,000	3,287,767
/30 Pipeline dia. 75 mm	m	0	0	76,300	0	0	0
/40 Pipeline dia. 50 mm	m	0	0	53,500	0	0	0
2) Asphalt Pavement							
/10 Pipeline dia. 150 mm 75%	m	0	0	16,100	0	0	0
/20 Pipeline dia. 100 mm 75%	m	2,100	0	16,100	0	33,810,000	395,023
/30 Pipeline dia. 75 mm 75%	m	0	0	16,100	0	0	0
/40 Pipeline dia. 50 mm 75%	m	0	0	16,100	0	0	0
Sub-total for 2.					**0**	**315,210,000**	**3,682,790**
3. Stream/River crossing							
1) Bridge (L>15m)	Nr.	2	0	10,704,100	0	21,408,200	250,125
2) Bridge (L<15m)	Nr.	3	0	4,733,300	0	14,199,900	165,906
Sub-total for 3.					**0**	**35,608,100**	**416,031**
4. Distribution network							
1) Ground reservoir	Nr.	1	0	22,547,000	0	22,547,000	263,430
2) Cholorinator		1	0	2,184,000	0	2,184,000	25,517
3) Service pipeline							
/10 Pipeline dia. 75 mm	m	1,350	0	76,300	0	103,005,000	1,203,470
/20 Pipeline dia. 50 mm	m	2,720	0	53,500	0	145,520,000	1,700,199
/30 Pipeline dia. 25 mm	m	4,290	0	35,500	0	152,295,000	1,779,355
4) Asphalt Pavement							
/10 Pipeline dia. 75 mm 75%	m	1,013	0	16,100	0	16,301,250	190,457
/20 Pipeline dia. 50 mm 75%	m	2,040	0	16,100	0	32,844,000	383,736
/30 Pipeline dia. 25 mm 75%	m	3,218	0	16,100	0	51,801,750	605,231
5) Pulic hydrant	Nr.	24	0	5,189,000	0	124,536,000	1,455,030
6) Pulic taps	Nr.	5	0	2,061,000	0	10,305,000	120,400
7) House conection	Nr.	188	0	1,550,000	0	291,400,000	3,404,603
8) Service meter	Nr.	0	0	0	0	0	0
Sub-total for 4.					**0**	**952,739,000**	**11,131,429**
Total of 1. - 4.					**0**	**1,789,238,100**	**20,904,756**

Note: - Price level; Oct. 2001
- Exchange rate:
US$ 1.0 = Rp.10,435
US$ 1.0 = J. Yen 121.92
J. Yen 1.0 = Rp.85.59

Table A12-3.3 Breakdown of Construction Cost by Village (10/19)

Construction works / Piong (NTB 16)

Works Items	Unit	Q'ty	Rate F.C.(Y)	Rate L.C (Rp.)	Amount F.C.(Y)	Amount L.C (Rp.)	Total (Y)
1. Intake facilities							
1) Intake facilities							
/10 Tappimg works from existing water system	Nr.	0	0	3,618,000	0	0	0
/20 Spring water intake	Nr.	0	0	2,222,000	0	0	0
/30 Tube well	Nr.	1	0	282,181,000	0	282,181,000	3,296,892
/40 Shallow well	Nr.	0	0	41,835,000	0	0	0
/50 Cave water intake	Nr.	0	0	3,866,000	0	0	0
2) Pumps							
/10 Submersible	Nr.	1	0	203,500,000	0	203,500,000	2,377,614
/20 Surface Centri-fugal	Nr.	0	0	46,924,000	0	0	0
Sub-total for 1.					**0**	**485,681,000**	**5,674,506**
2. Transmission and Distribution main							
1) Pipeline exca. Inst. Backfill.							
/10 Pipeline dia. 150 mm	m	0	0	166,900	0	0	0
/20 Pipeline dia. 100 mm	m	0	0	100,500	0	0	0
/30 Pipeline dia. 75 mm	m	590	0	76,300	0	45,017,000	525,961
/40 Pipeline dia. 50 mm	m	0	0	53,500	0	0	0
2) Asphalt Pavement							
/10 Pipeline dia. 150 mm 75%	m	0	0	16,100	0	0	0
/20 Pipeline dia. 100 mm 75%	m	0	0	16,100	0	0	0
/30 Pipeline dia. 75 mm 75%	m	443	0	16,100	0	7,124,250	83,237
/40 Pipeline dia. 50 mm 75%	m	0	0	16,100	0	0	0
Sub-total for 2.					**0**	**52,141,250**	**609,198**
3. Stream/River crossing							
1) Bridge (L>15m)	Nr.	0	0	10,704,100	0	0	0
2) Bridge (L<15m)	Nr.	0	0	4,733,300	0	0	0
Sub-total for 3.					**0**	**0**	**0**
4. Distribution network							
1) Ground reservoir	Nr.	1	0	22,547,000	0	22,547,000	263,430
2) Cholorinator		1	0	2,184,000	0	2,184,000	25,517
3) Service pipeline							
/10 Pipeline dia. 75 mm	m	0	0	76,300	0	0	0
/20 Pipeline dia. 50 mm	m	3,270	0	53,500	0	174,945,000	2,043,989
/30 Pipeline dia. 25 mm	m	2,970	0	35,500	0	105,435,000	1,231,861
4) Asphalt Pavement							
/10 Pipeline dia. 75 mm 75%	m	0	0	16,100	0	0	0
/20 Pipeline dia. 50 mm 75%	m	2,453	0	16,100	0	39,485,250	461,330
/30 Pipeline dia. 25 mm 75%	m	2,228	0	16,100	0	35,862,750	419,006
5) Pulic hydrant	Nr.	13	0	5,189,000	0	67,457,000	788,141
6) Pulic taps	Nr.	5	0	2,061,000	0	10,305,000	120,400
7) House conection	Nr.	133	0	1,550,000	0	206,150,000	2,408,576
8) Service meter	Nr.	0	0	0	0	0	0
Sub-total for 4.					**0**	**664,371,000**	**7,762,250**
Total of 1. - 4.					**0**	**1,202,193,250**	**14,045,955**

Note: - Price level; Oct. 2001
- Exchange rate:
US$ 1.0 = Rp.10,435
US$ 1.0 = J. Yen 121.92
J. Yen 1.0 = Rp.85.59

Table A12-3.3 Breakdown of Construction Cost by Village (11/19)

Construction works / Kawuwu (NTB 18-a)

Works Items	Unit	Q'ty	Rate F.C.(Y)	Rate L.C (Rp.)	Amount F.C.(Y)	Amount L.C (Rp.)	Total (Y)
1. Intake facilities							
1) Intake facilities							
/10 Tappimg works from existing water system	Nr.	0	0	3,618,000	0	0	0
/20 Spring water intake	Nr.	0	0	2,222,000	0	0	0
/30 Tube well	Nr.	0	0	282,181,000	0	0	0
/40 Shallow well	Nr.	1	0	41,835,000	0	41,835,000	488,784
/50 Cave water intake	Nr.	0	0	3,866,000	0	0	0
2) Pumps							
/10 Submersible	Nr.	1	0	203,500,000	0	203,500,000	2,377,614
/20 Surface Centri-fugal	Nr.	0	0	46,924,000	0	0	0
Sub-total for 1.					**0**	**245,335,000**	**2,866,398**
2. Transmission and Distribution main							
1) Pipeline exca. Inst. Backfill.							
/10 Pipeline dia. 150 mm	m	0	0	166,900	0	0	0
/20 Pipeline dia. 100 mm	m	0	0	100,500	0	0	0
/30 Pipeline dia. 75 mm	m	0	0	76,300	0	0	0
/40 Pipeline dia. 50 mm	m	890	0	53,500	0	47,615,000	556,315
2) Asphalt Pavement							
/10 Pipeline dia. 150 mm 75%	m	0	0	16,100	0	0	0
/20 Pipeline dia. 100 mm 75%	m	0	0	16,100	0	0	0
/30 Pipeline dia. 75 mm 75%	m	0	0	16,100	0	0	0
/40 Pipeline dia. 50 mm 75%	m	668	0	16,100	0	10,746,750	125,561
Sub-total for 2.					**0**	**58,361,750**	**681,876**
3. Stream/River crossing							
1) Bridge (L>15m)	Nr.	0	0	10,704,100	0	0	0
2) Bridge (L<15m)	Nr.	0	0	4,733,300	0	0	0
Sub-total for 3.					**0**	**0**	**0**
4. Distribution network							
1) Ground reservoir	Nr.	0	0	22,547,000	0	0	0
2) Cholorinator		1	0	2,184,000	0	2,184,000	25,517
3) Service pipeline							
/10 Pipeline dia. 75 mm	m	0	0	76,300	0	0	0
/20 Pipeline dia. 50 mm	m	0	0	53,500	0	0	0
/30 Pipeline dia. 25 mm	m	480	0	35,500	0	17,040,000	199,089
4) Asphalt Pavement							
/10 Pipeline dia. 75 mm 75%	m	0	0	16,100	0	0	0
/20 Pipeline dia. 50 mm 75%	m	0	0	16,100	0	0	0
/30 Pipeline dia. 25 mm 75%	m	360	0	16,100	0	5,796,000	67,718
5) Pulic hydrant	Nr.	3	0	5,189,000	0	15,567,000	181,879
6) Pulic taps	Nr.	2	0	2,061,000	0	4,122,000	48,160
7) House conection	Nr.	17	0	1,550,000	0	26,350,000	307,863
8) Service meter	Nr.	0	0	0	0	0	0
Sub-total for 4.					**0**	**71,059,000**	**830,225**
Total of 1. - 4.					**0**	**374,755,750**	**4,378,499**

Note: - Price level; Oct. 2001
- Exchange rate:
US$ 1.0 = Rp.10,435
US$ 1.0 = J. Yen 121.92
J. Yen 1.0 = Rp.85.59

Table A12-3.3 Breakdown of Construction Cost by Village (12/19)

Construction works / Kawuwu (NTB 18-b)

Works Items	Unit	Q'ty	Rate F.C.(Y)	Rate L.C (Rp.)	Amount F.C.(Y)	Amount L.C (Rp.)	Total (Y)
1. Intake facilities							
1) Intake facilities							
/10 Tappimg works from existing water system	Nr.	0	0	3,618,000	0	0	0
/20 Spring water intake	Nr.	1	0	2,222,000	0	2,222,000	25,961
/30 Tube well	Nr.	0	0	282,181,000	0	0	0
/40 Shallow well	Nr.	0	0	41,835,000	0	0	0
/50 Cave water intake	Nr.	0	0	3,866,000	0	0	0
2) Pumps							
/10 Submersible	Nr.	0	0	203,500,000	0	0	0
/20 Surface Centri-fugal	Nr.	0	0	46,924,000	0	0	0
Sub-total for 1.					**0**	**2,222,000**	**25,961**
2. Transmission and Distribution main							
1) Pipeline exca. Inst. Backfill.							
/10 Pipeline dia. 150 mm	m	0	0	166,900	0	0	0
/20 Pipeline dia. 100 mm	m	0	0	100,500	0	0	0
/30 Pipeline dia. 75 mm	m	100	0	76,300	0	7,630,000	89,146
/40 Pipeline dia. 50 mm	m	100	0	53,500	0	5,350,000	62,507
2) Asphalt Pavement							
/10 Pipeline dia. 150 mm 75%	m	0	0	16,100	0	0	0
/20 Pipeline dia. 100 mm 75%	m	0	0	16,100	0	0	0
/30 Pipeline dia. 75 mm 75%	m	75	0	16,100	0	1,207,500	14,108
/40 Pipeline dia. 50 mm 75%	m	75	0	16,100	0	1,207,500	14,108
Sub-total for 2.					**0**	**15,395,000**	**179,869**
3. Stream/River crossing							
1) Bridge (L>15m)	Nr.	0	0	10,704,100	0	0	0
2) Bridge (L<15m)	Nr.	0	0	4,733,300	0	0	0
Sub-total for 3.					**0**	**0**	**0**
4. Distribution network							
1) Ground reservoir	Nr.	0	0	22,547,000	0	0	0
2) Cholorinator		1	0	2,184,000	0	2,184,000	25,517
3) Service pipeline							
/10 Pipeline dia. 75 mm	m	0	0	76,300	0	0	0
/20 Pipeline dia. 50 mm	m	0	0	53,500	0	0	0
/30 Pipeline dia. 25 mm	m	100	0	35,500	0	3,550,000	41,477
4) Asphalt Pavement							
/10 Pipeline dia. 75 mm 75%	m	0	0	16,100	0	0	0
/20 Pipeline dia. 50 mm 75%	m	0	0	16,100	0	0	0
/30 Pipeline dia. 25 mm 75%	m	75	0	16,100	0	1,207,500	14,108
5) Pulic hydrant	Nr.	3	0	5,189,000	0	15,567,000	181,879
6) Pulic taps	Nr.	0	0	2,061,000	0	0	0
7) House conection	Nr.	0	0	1,550,000	0	0	0
8) Service meter	Nr.	0	0	0	0	0	0
Sub-total for 4.					**0**	**22,508,500**	**262,980**
Total of 1. - 4.					**0**	**40,125,500**	**468,811**

Note: - Price level; Oct. 2001
- Exchange rate:
US$ 1.0 = Rp.10,435
US$ 1.0 = J. Yen 121.92
J. Yen 1.0 = Rp.85.59

Table A12-3.3 Breakdown of Construction Cost by Village (13/19)

Construction works / Sinar Hading (NTT 6)

Works Items	Unit	Q'ty	Rate F.C.(Y)	Rate L.C (Rp.)	Amount F.C.(Y)	Amount L.C (Rp.)	Total (Y)
1. Intake facilities							
1) Intake facilities							
/10 Tappimg works from existing water system	Nr.	0	0	3,618,000	0	0	0
/20 Spring water intake	Nr.	0	0	2,222,000	0	0	0
/30 Tube well	Nr.	0	0	282,181,000	0	0	0
/40 Shallow well	Nr.	0	0	41,835,000	0	0	0
/50 Cave water intake	Nr.	0	0	3,866,000	0	0	0
2) Pumps							
/10 Submersible	Nr.	0	0	203,500,000	0	0	0
/20 Surface Centri-fugal	Nr.	0	0	46,924,000	0	0	0
Sub-total for 1.					**0**	**0**	**0**
2. Transmission and Distribution main							
1) Pipeline exca. Inst. Backfill.							
/10 Pipeline dia. 150 mm	m	0	0	166,900	0	0	0
/20 Pipeline dia. 100 mm	m	0	0	100,500	0	0	0
/30 Pipeline dia. 75 mm	m	0	0	76,300	0	0	0
/40 Pipeline dia. 50 mm	m	0	0	53,500	0	0	0
2) Asphalt Pavement							
/10 Pipeline dia. 150 mm 75%	m	0	0	16,100	0	0	0
/20 Pipeline dia. 100 mm 75%	m	0	0	16,100	0	0	0
/30 Pipeline dia. 75 mm 75%	m	0	0	16,100	0	0	0
/40 Pipeline dia. 50 mm 75%	m	0	0	16,100	0	0	0
Sub-total for 2.					**0**	**0**	**0**
3. Stream/River crossing							
1) Bridge (L>15m)	Nr.	0	0	10,704,100	0	0	0
2) Bridge (L<15m)	Nr.	0	0	4,733,300	0	0	0
Sub-total for 3.					**0**	**0**	**0**
4. Distribution network							
1) Ground reservoir	Nr.	1	0	22,547,000	0	22,547,000	263,430
2) Cholorinator		4	0	2,184,000	0	8,736,000	102,068
3) Service pipeline							
/10 Pipeline dia. 75 mm	m	0	0	76,300	0	0	0
/20 Pipeline dia. 50 mm	m	3,150	0	53,500	0	168,525,000	1,968,980
/30 Pipeline dia. 25 mm	m	4,340	0	35,500	0	154,070,000	1,800,093
4) Asphalt Pavement							
/10 Pipeline dia. 75 mm 75%	m	0	0	16,100	0	0	0
/20 Pipeline dia. 50 mm 75%	m	2,363	0	16,100	0	38,036,250	444,401
/30 Pipeline dia. 25 mm 75%	m	3,255	0	16,100	0	52,405,500	612,285
5) Pulic hydrant	Nr.	5	0	5,189,000	0	25,945,000	303,131
6) Pulic taps	Nr.	10	0	2,061,000	0	20,610,000	240,799
7) House conection	Nr.	207	0	1,550,000	0	320,850,000	3,748,686
8) Service meter	Nr.	222	0	0	0	0	0
Sub-total for 4.					**0**	**811,724,750**	**9,483,874**
Total of 1. - 4.					**0**	**811,724,750**	**9,483,874**

Note: - Price level; Oct. 2001
- Exchange rate:
US$ 1.0 = Rp.10,435
US$ 1.0 = J. Yen 121.92
J. Yen 1.0 = Rp.85.59

Table A12-3.3 Breakdown of Construction Cost by Village (14/19)

Construction works / Ile padung (NTT 7)

Works Items	Unit	Q'ty	Rate F.C.(Y)	Rate L.C (Rp.)	Amount F.C.(Y)	Amount L.C (Rp.)	Total (Y)
1. Intake facilities							
1) Intake facilities							
/10 Tappimg works from existing water system	Nr.	0	0	3,618,000	0	0	0
/20 Spring water intake	Nr.	1	0	2,222,000	0	2,222,000	25,961
/30 Tube well	Nr.	0	0	282,181,000	0	0	0
/40 Shallow well	Nr.	0	0	41,835,000	0	0	0
/50 Cave water intake	Nr.	0	0	3,866,000	0	0	0
2) Pumps							
/10 Submersible	Nr.	0	0	203,500,000	0	0	0
/20 Surface Centri-fugal	Nr.	4	0	46,924,000	0	187,696,000	2,192,966
Sub-total for 1.					**0**	**189,918,000**	**2,218,927**
2. Transmission and Distribution main							
1) Pipeline exca. Inst. Backfill.							
/10 Pipeline dia. 150 mm	m	0	0	166,900	0	0	0
/20 Pipeline dia. 100 mm	m	3,500	0	100,500	0	351,750,000	4,109,709
/30 Pipeline dia. 75 mm	m	1,340	0	76,300	0	102,242,000	1,194,555
/40 Pipeline dia. 50 mm	m	0	0	53,500	0	0	0
2) Asphalt Pavement							
/10 Pipeline dia. 150 mm 75%	m	0	0	16,100	0	0	0
/20 Pipeline dia. 100 mm 75%	m	2,625	0	16,100	0	42,262,500	493,778
/30 Pipeline dia. 75 mm 75%	m	1,005	0	16,100	0	16,180,500	189,047
/40 Pipeline dia. 50 mm 75%	m	0	0	16,100	0	0	0
Sub-total for 2.					**0**	**512,435,000**	**5,987,090**
3. Stream/River crossing							
1) Bridge (L>15m)	Nr.	0	0	10,704,100	0	0	0
2) Bridge (L<15m)	Nr.	0	0	4,733,300	0	0	0
Sub-total for 3.					**0**	**0**	**0**
4. Distribution network							
1) Ground reservoir	Nr.	3	0	22,547,000	0	67,641,000	790,291
2) Cholorinator		4	0	2,184,000	0	8,736,000	102,068
3) Service pipeline							
/10 Pipeline dia. 75 mm	m	0	0	76,300	0	0	0
/20 Pipeline dia. 50 mm	m	2,850	0	53,500	0	152,475,000	1,781,458
/30 Pipeline dia. 25 mm	m	3,890	0	35,500	0	138,095,000	1,613,448
4) Asphalt Pavement							
/10 Pipeline dia. 75 mm 75%	m	0	0	16,100	0	0	0
/20 Pipeline dia. 50 mm 75%	m	2,138	0	16,100	0	34,413,750	402,077
/30 Pipeline dia. 25 mm 75%	m	2,918	0	16,100	0	46,971,750	548,800
5) Pulic hydrant	Nr.	7	0	5,189,000	0	36,323,000	424,384
6) Pulic taps	Nr.	0	0	2,061,000	0	0	0
7) House conection	Nr.	180	0	1,550,000	0	279,000,000	3,259,727
8) Service meter	Nr.	202	0	0	0	0	0
Sub-total for 4.					**0**	**763,655,500**	**8,922,251**
Total of 1. - 4.					**0**	**1,466,008,500**	**17,128,268**

Note: - Price level; Oct. 2001
- Exchange rate:
US$ 1.0 = Rp.10,435
US$ 1.0 = J. Yen 121.92
J. Yen 1.0 = Rp.85.59

Table A12-3.3 Breakdown of Construction Cost by Village (15/19)

Construction works / Weerame (NTT 18)

Works Items	Unit	Q'ty	Rate F.C.(Y)	Rate L.C (Rp.)	Amount F.C.(Y)	Amount L.C (Rp.)	Total (Y)
1. Intake facilities							
1) Intake facilities							
/10 Tappimg works from existing water system	Nr.	0	0	3,618,000	0	0	0
/20 Spring water intake	Nr.	0	0	2,222,000	0	0	0
/30 Tube well	Nr.	0	0	282,181,000	0	0	0
/40 Shallow well	Nr.	0	0	41,835,000	0	0	0
/50 Cave water intake	Nr.	1	0	3,866,000	0	3,866,000	45,169
2) Pumps							
/10 Submersible	Nr.	0	0	203,500,000	0	0	0
/20 Surface Centri-fugal	Nr.	2	0	46,924,000	0	93,848,000	1,096,483
Sub-total for 1.					**0**	**97,714,000**	**1,141,652**
2. Transmission and Distribution main							
1) Pipeline exca. Inst. Backfill.							
/10 Pipeline dia. 150 mm	m	0	0	166,900	0	0	0
/20 Pipeline dia. 100 mm	m	0	0	100,500	0	0	0
/30 Pipeline dia. 75 mm	m	550	0	76,300	0	41,965,000	490,303
/40 Pipeline dia. 50 mm	m	0	0	53,500	0	0	0
2) Asphalt Pavement							
/10 Pipeline dia. 150 mm 75%	m	0	0	16,100	0	0	0
/20 Pipeline dia. 100 mm 75%	m	0	0	16,100	0	0	0
/30 Pipeline dia. 75 mm 75%	m	413	0	16,100	0	6,641,250	77,594
/40 Pipeline dia. 50 mm 75%	m	0	0	16,100	0	0	0
Sub-total for 2.					**0**	**48,606,250**	**567,896**
3. Stream/River crossing							
1) Bridge (L>15m)	Nr.	0	0	10,704,100	0	0	0
2) Bridge (L<15m)	Nr.	0	0	4,733,300	0	0	0
Sub-total for 3.					**0**	**0**	**0**
4. Distribution network							
1) Ground reservoir	Nr.	1	0	22,547,000	0	22,547,000	263,430
2) Cholorinator		1	0	2,184,000	0	2,184,000	25,517
3) Service pipeline							
/10 Pipeline dia. 75 mm	m	420	0	76,300	0	32,046,000	374,413
/20 Pipeline dia. 50 mm	m	2,330	0	53,500	0	124,655,000	1,456,420
/30 Pipeline dia. 25 mm	m	5,440	0	35,500	0	193,120,000	2,256,338
4) Asphalt Pavement							
/10 Pipeline dia. 75 mm 75%	m	315	0	16,100	0	5,071,500	59,253
/20 Pipeline dia. 50 mm 75%	m	1,748	0	16,100	0	28,134,750	328,715
/30 Pipeline dia. 25 mm 75%	m	4,080	0	16,100	0	65,688,000	767,473
5) Pulic hydrant	Nr.	8	0	5,189,000	0	41,512,000	485,010
6) Pulic taps	Nr.	10	0	2,061,000	0	20,610,000	240,799
7) House conection	Nr.	259	0	1,550,000	0	401,450,000	4,690,384
8) Service meter	Nr.	0	0	0	0	0	0
Sub-total for 4.					**0**	**937,018,250**	**10,947,754**
Total of 1. - 4.					**0**	**1,083,338,500**	**12,657,302**

Note: - Price level; Oct. 2001
- Exchange rate:
US$ 1.0 = Rp.10,435
US$ 1.0 = J. Yen 121.92
J. Yen 1.0 = Rp.85.59

Table A12-3.3 Breakdown of Construction Cost by Village (16/19)

Construction works / Kondamara (NTT 19)

Works Items	Unit	Q'ty	Rate F.C.(Y)	Rate L.C (Rp.)	Amount F.C.(Y)	Amount L.C (Rp.)	Total (Y)
1. Intake facilities							
1) Intake facilities							
/10 Tappimg works from existing water system	Nr.	0	0	3,618,000	0	0	0
/20 Spring water intake	Nr.	1	0	2,222,000	0	2,222,000	25,961
/30 Tube well	Nr.	0	0	282,181,000	0	0	0
/40 Shallow well	Nr.	0	0	41,835,000	0	0	0
/50 Cave water intake	Nr.	0	0	3,866,000	0	0	0
2) Pumps							
/10 Submersible	Nr.	0	0	203,500,000	0	0	0
/20 Surface Centri-fugal	Nr.	2	0	46,924,000	0	93,848,000	1,096,483
Sub-total for 1.					**0**	**96,070,000**	**1,122,444**
2. Transmission and Distribution main							
1) Pipeline exca. Inst. Backfill.							
/10 Pipeline dia. 150 mm	m	0	0	166,900	0	0	0
/20 Pipeline dia. 100 mm	m	0	0	100,500	0	0	0
/30 Pipeline dia. 75 mm	m	2,975	0	76,300	0	226,992,500	2,652,091
/40 Pipeline dia. 50 mm	m	4,025	0	53,500	0	215,337,500	2,515,919
2) Asphalt Pavement							
/10 Pipeline dia. 150 mm 75%	m	0	0	16,100	0	0	0
/20 Pipeline dia. 100 mm 75%	m	0	0	16,100	0	0	0
/30 Pipeline dia. 75 mm 75%	m	2,231	0	16,100	0	35,923,125	419,712
/40 Pipeline dia. 50 mm 75%	m	3,019	0	16,100	0	48,601,875	567,845
Sub-total for 2.					**0**	**526,855,000**	**6,155,567**
3. Stream/River crossing							
1) Bridge (L>15m)	Nr.	0	0	10,704,100	0	0	0
2) Bridge (L<15m)	Nr.	4	0	4,733,300	0	18,933,200	221,208
Sub-total for 3.					**0**	**18,933,200**	**221,208**
4. Distribution network							
1) Ground reservoir	Nr.	0	0	22,547,000	0	0	0
2) Cholorinator		1	0	2,184,000	0	2,184,000	25,517
3) Service pipeline							
/10 Pipeline dia. 75 mm	m	0	0	76,300	0	0	0
/20 Pipeline dia. 50 mm	m	0	0	53,500	0	0	0
/30 Pipeline dia. 25 mm	m	1,960	0	35,500	0	69,580,000	812,945
4) Asphalt Pavement							
/10 Pipeline dia. 75 mm 75%	m	0	0	16,100	0	0	0
/20 Pipeline dia. 50 mm 75%	m	0	0	16,100	0	0	0
/30 Pipeline dia. 25 mm 75%	m	1,470	0	16,100	0	23,667,000	276,516
5) Pulic hydrant	Nr.	15	0	5,189,000	0	77,835,000	909,394
6) Pulic taps	Nr.	20	0	2,061,000	0	41,220,000	481,598
7) House conection	Nr.	73	0	1,550,000	0	113,150,000	1,322,000
8) Service meter	Nr.	0	0	0	0	0	0
Sub-total for 4.					**0**	**327,636,000**	**3,827,971**
Total of 1. - 4.					**0**	**969,494,200**	**11,327,190**

Note: - Price level; Oct. 2001
- Exchange rate:
US$ 1.0 = Rp.10,435
US$ 1.0 = J. Yen 121.92
J. Yen 1.0 = Rp.85.59

Table A12-3.3 Breakdown of Construction Cost by Village (17/19)

Construction works / Oebau (NTT 21)

Works Items	Unit	Q'ty	Rate F.C.(Y)	Rate L.C (Rp.)	Amount F.C.(Y)	Amount L.C (Rp.)	Total (Y)
1. Intake facilities							
1) Intake facilities							
/10 Tappimg works from existing water system	Nr.	0	0	3,618,000	0	0	0
/20 Spring water intake	Nr.	0	0	2,222,000	0	0	0
/30 Tube well	Nr.	0	0	282,181,000	0	0	0
/40 Shallow well	Nr.	0	0	41,835,000	0	0	0
/50 Cave water intake	Nr.	1	0	3,866,000	0	3,866,000	45,169
2) Pumps							
/10 Submersible	Nr.	0	0	203,500,000	0	0	0
/20 Surface Centri-fugal	Nr.	1	0	46,924,000	0	46,924,000	548,242
Sub-total for 1.					**0**	**50,790,000**	**593,410**
2. Transmission and Distribution main							
1) Pipeline exca. Inst. Backfill.							
/10 Pipeline dia. 150 mm	m	0	0	166,900	0	0	0
/20 Pipeline dia. 100 mm	m	0	0	100,500	0	0	0
/30 Pipeline dia. 75 mm	m	1,080	0	76,300	0	82,404,000	962,776
/40 Pipeline dia. 50 mm	m	0	0	53,500	0	0	0
2) Asphalt Pavement							
/10 Pipeline dia. 150 mm 75%	m	0	0	16,100	0	0	0
/20 Pipeline dia. 100 mm 75%	m	0	0	16,100	0	0	0
/30 Pipeline dia. 75 mm 75%	m	810	0	16,100	0	13,041,000	152,366
/40 Pipeline dia. 50 mm 75%	m	0	0	16,100	0	0	0
Sub-total for 2.					**0**	**95,445,000**	**1,115,142**
3. Stream/River crossing							
1) Bridge (L>15m)	Nr.	2	0	10,704,100	0	21,408,200	250,125
2) Bridge (L<15m)	Nr.	0	0	4,733,300	0	0	0
Sub-total for 3.					**0**	**21,408,200**	**250,125**
4. Distribution network							
1) Ground reservoir	Nr.	2	0	22,547,000	0	45,094,000	526,861
2) Cholorinator		1	0	2,184,000	0	2,184,000	25,517
3) Service pipeline							
/10 Pipeline dia. 75 mm	m	0	0	76,300	0	0	0
/20 Pipeline dia. 50 mm	m	4,950	0	53,500	0	264,825,000	3,094,111
/30 Pipeline dia. 25 mm	m	560	0	35,500	0	19,880,000	232,270
4) Asphalt Pavement							
/10 Pipeline dia. 75 mm 75%	m	0	0	16,100	0	0	0
/20 Pipeline dia. 50 mm 75%	m	3,713	0	16,100	0	59,771,250	698,344
/30 Pipeline dia. 25 mm 75%	m	420	0	16,100	0	6,762,000	79,005
5) Pulic hydrant	Nr.	10	0	5,189,000	0	51,890,000	606,262
6) Pulic taps	Nr.	10	0	2,061,000	0	20,610,000	240,799
7) House conection	Nr.	13	0	1,550,000	0	20,150,000	235,425
8) Service meter	Nr.	0	0	0	0	0	0
Sub-total for 4.					**0**	**491,166,250**	**5,738,594**
Total of 1. - 4.					**0**	**658,809,450**	**7,697,271**

Note: - Price level; Oct. 2001
- Exchange rate:
US$ 1.0 = Rp.10,435
US$ 1.0 = J. Yen 121.92
J. Yen 1.0 = Rp.85.59

Table A12-3.3 Breakdown of Construction Cost by Village (18/19)

Construction works / Nusakdale (NTT 23)

Works Items	Unit	Q'ty	Rate F.C.(Y)	Rate L.C (Rp.)	Amount F.C.(Y)	Amount L.C (Rp.)	Total (Y)
1. Intake facilities							
1) Intake facilities							
/10 Tappimg works from existing water system	Nr.	0	0	3,618,000	0	0	0
/20 Spring water intake	Nr.	1	0	2,222,000	0	2,222,000	25,961
/30 Tube well	Nr.	0	0	282,181,000	0	0	0
/40 Shallow well	Nr.	0	0	41,835,000	0	0	0
/50 Cave water intake	Nr.	0	0	3,866,000	0	0	0
2) Pumps							
/10 Submersible	Nr.	0	0	203,500,000	0	0	0
/20 Surface Centri-fugal	Nr.	0	0	46,924,000	0	0	0
Sub-total for 1.					**0**	**2,222,000**	**25,961**
2. Transmission and Distribution main							
1) Pipeline exca. Inst. Backfill.							
/10 Pipeline dia. 150 mm	m	0	0	166,900	0	0	0
/20 Pipeline dia. 100 mm	m	0	0	100,500	0	0	0
/30 Pipeline dia. 75 mm	m	0	0	76,300	0	0	0
/40 Pipeline dia. 50 mm	m	1,500	0	53,500	0	80,250,000	937,610
2) Asphalt Pavement							
/10 Pipeline dia. 150 mm 75%	m		0	16,100	0	0	0
/20 Pipeline dia. 100 mm 75%	m	0	0	16,100	0	0	0
/30 Pipeline dia. 75 mm 75%	m	0	0	16,100	0	0	0
/40 Pipeline dia. 50 mm 75%	m	1,125	0	16,100	0	18,112,500	211,619
Sub-total for 2.					**0**	**98,362,500**	**1,149,229**
3. Stream/River crossing							
1) Bridge (L>15m)	Nr.	0	0	10,704,100	0	0	0
2) Bridge (L<15m)	Nr.	3	0	4,733,300	0	14,199,900	165,906
Sub-total for 3.					**0**	**14,199,900**	**165,906**
4. Distribution network							
1) Ground reservoir	Nr.	0	0	22,547,000	0	0	0
2) Cholorinator		1	0	2,184,000	0	2,184,000	25,517
3) Service pipeline							
/10 Pipeline dia. 75 mm	m	0	0	76,300	0	0	0
/20 Pipeline dia. 50 mm	m	1,000	0	53,500	0	53,500,000	625,073
/30 Pipeline dia. 25 mm	m	400	0	35,500	0	14,200,000	165,907
4) Asphalt Pavement							
/10 Pipeline dia. 75 mm 75%	m	0	0	16,100	0	0	0
/20 Pipeline dia. 50 mm 75%	m	750	0	16,100	0	12,075,000	141,080
/30 Pipeline dia. 25 mm 75%	m	300	0	16,100	0	4,830,000	56,432
5) Pulic hydrant	Nr.	6	0	5,189,000	0	31,134,000	363,757
6) Pulic taps	Nr.	10	0	2,061,000	0	20,610,000	240,799
7) House conection	Nr.	9	0	1,550,000	0	13,950,000	162,986
8) Service meter	Nr.	0	0	0	0	0	0
Sub-total for 4.					**0**	**152,483,000**	**1,781,552**
Total of 1. - 4.					**0**	**267,267,400**	**3,122,648**

Note: - Price level; Oct. 2001
- Exchange rate:
US$ 1.0 = Rp.10,435
US$ 1.0 = J. Yen 121.92
J. Yen 1.0 = Rp.85.59

Table A12-3.3 Breakdown of Construction Cost by Village (19/19)

Construction works / Tarus (NTT 24)

Works Items	Unit	Q'ty	Rate F.C.(Y)	Rate L.C (Rp.)	Amount F.C.(Y)	Amount L.C (Rp.)	Total (Y)
1. Intake facilities							
1) Intake facilities							
/10 Tappimg works from existing water system	Nr.	0	0	3,618,000	0	0	0
/20 Spring water intake	Nr.	1	0	2,222,000	0	2,222,000	25,961
/30 Tube well	Nr.	0	0	282,181,000	0	0	0
/40 Shallow well	Nr.	0	0	41,835,000	0	0	0
/50 Cave water intake	Nr.	0	0	3,866,000	0	0	0
2) Pumps							
/10 Submersible	Nr.	2	0	203,500,000	0	407,000,000	4,755,228
/20 Surface Centri-fugal	Nr.	2	0	46,924,000	0	93,848,000	1,096,483
Sub-total for 1.					**0**	**503,070,000**	**5,877,673**
2. Transmission and Distribution main							
1) Pipeline exca. Inst. Backfill.							
/10 Pipeline dia. 150 mm	m	0	0	166,900	0	0	0
/20 Pipeline dia. 100 mm	m	3,700	0	100,500	0	371,850,000	4,344,550
/30 Pipeline dia. 75 mm	m	100	0	76,300	0	7,630,000	89,146
/40 Pipeline dia. 50 mm	m	0	0	53,500	0	0	0
2) Asphalt Pavement							
/10 Pipeline dia. 150 mm 75%	m	0	0	16,100	0	0	0
/20 Pipeline dia. 100 mm 75%	m	2,775	0	16,100	0	44,677,500	521,994
/30 Pipeline dia. 75 mm 75%	m	75	0	16,100	0	1,207,500	14,108
/40 Pipeline dia. 50 mm 75%	m	0	0	16,100	0	0	0
Sub-total for 2.					**0**	**425,365,000**	**4,969,798**
3. Stream/River crossing							
1) Bridge (L>15m)	Nr.	1	0	10,704,100	0	10,704,100	125,063
2) Bridge (L<15m)	Nr.	0	0	4,733,300	0	0	0
Sub-total for 3.					**0**	**10,704,100**	**125,063**
4. Distribution network							
1) Ground reservoir	Nr.	2	0	22,547,000	0	45,094,000	526,861
2) Cholorinator	Nr.	2	0	2,184,000	0	4,368,000	51,034
3) Service pipeline							
/10 Pipeline dia. 75 mm	m	1,100	0	76,300	0	83,930,000	980,605
/20 Pipeline dia. 50 mm	m	5,600	0	53,500	0	299,600,000	3,500,409
/30 Pipeline dia. 25 mm	m	13,080	0	35,500	0	464,340,000	5,425,166
4) Asphalt Pavement							
/10 Pipeline dia. 75 mm 75%	m	825	0	16,100	0	13,282,500	155,188
/20 Pipeline dia. 50 mm 75%	m	4,200	0	16,100	0	67,620,000	790,046
/30 Pipeline dia. 25 mm 75%	m	9,810	0	16,100	0	157,941,000	1,845,321
5) Pulic hydrant	Nr.	13	0	5,189,000	0	67,457,000	788,141
6) Pulic taps	Nr.	10	0	2,061,000	0	20,610,000	240,799
7) House conection	Nr.	636	0	1,550,000	0	985,800,000	11,517,701
8) Service meter	Nr.	659	0	0	0	0	0
Sub-total for 4.					**0**	**2,210,042,500**	**25,821,270**
Total of 1. - 4.					**0**	**3,149,181,600**	**36,793,803**

Note: - Price level; Oct. 2001
- Exchange rate:
US$ 1.0 = Rp.10,435
US$ 1.0 = J. Yen 121.92
J. Yen 1.0 = Rp.85.59

Table A12-3.4 (Plan 1) Estimated Cost for Consultancy Services (1/2)

Phase 1 (NTB)

Item	Unit	Q'ty	Amount F.C.(Y)	Amount L.C. (Rp.)	Total (Y)	Equiv. (Rp.)		
1. Detailed design								
1) Remuneration	M/M	37	18,430,000	44,652,000	18,951,696	1,622,075,700	29%	
- Foreign expert	M/M	21	18,430,000	0	18,430,000	1,577,423,700		
- Local expert	M/M	16	0	44,652,000	521,696	44,652,000		
2) Transportation	L.S.		10,080,000	76,260,000	10,970,992	939,007,200	17%	
3) Survey, Boring and pumping test	L.S.		6,729,000	0	6,729,000	575,935,110	10%	
4) Report binding	page	9,000	0	6,120,000	71,504	6,120,000	0%	
5) Office equipment	L.S.		0	104,300,000	1,218,600	104,300,000	2%	
6) Office running cost	month	4	0	100,000,000	1,168,361	100,000,000	2%	
7) Overhead (140% of foreign expert)	L.S.	140%	25,802,000	0	25,802,000	2,208,393,180	40%	
Total for 1.			**61,041,000**	**331,332,000**	**64,912,153**	**5,555,831,190**	100%	34%
2. Construction supervision								
1) Remuneration	M/M	73	21,540,000	170,414,000	23,531,050	2,014,022,600	35%	
- Foreign expert	M/M	22	21,540,000	0	21,540,000	1,843,608,600		
- Local expert	M/M	51	0	170,414,000	1,991,050	170,414,000		
2) Transportation	L.S.		9,360,000	169,760,000	11,343,409	970,882,400	17%	
3) Report binding	page	13,000	0	8,840,000	103,283	8,840,000	0%	
4) Office equipment	L.S.		0	11,200,000	130,856	11,200,000	0%	
5) Office running cost	month	16	0	204,000,000	2,383,456	204,000,000	4%	
6) Overhead (140% of foreign expert)	L.S.	140%	30,156,000	0	30,156,000	2,581,052,040	45%	
Total for 2.			**61,056,000**	**564,214,000**	**67,648,055**	**5,789,997,040**	100%	36%
3. Soft component services								
1) Remuneration	M/M	253	11,138,000	1,249,920,000	25,741,575	2,203,221,420	46%	
- Foreign expert	M/M	19	11,138,000	0	11,138,000	953,301,420		
- Local expert	M/M	234	0	1,249,920,000	14,603,575	1,249,920,000		
2) Transportation	L.S.		10,440,000	195,525,000	12,724,437	1,089,084,600	23%	
3) Report binding	page	16,000	0	10,880,000	127,118	10,880,000	0%	
4) Office equipment	L.S.		0	11,000,000	128,520	11,000,000	0%	
5) Office running cost	month	6	0	150,000,000	1,752,541	150,000,000	3%	
6) Overhead (140% of foreign expert)	L.S.	140%	15,593,200	0	15,593,200	1,334,621,988	28%	
Total for 3.			**37,171,200**	**1,617,325,000**	**56,067,391**	**4,798,808,008**	100%	30%
Total of 1. - 3.			**159,268,200**	**2,512,871,000**	**188,627,599**	**16,144,636,238**		100%
4. Physical Contingency		5%	7,963,410	125,643,550	9,431,380	807,231,812		
Total of 1. - 4.			**167,231,610**	**2,638,514,550**	**198,058,979**	**16,951,868,050**		
5. Price Contingency			1,672,316	527,702,910	7,837,790	670,836,436		
Total of 1. - 5.			**168,903,926**	**3,166,217,460**	**205,896,769**	**17,622,704,486**		

Note: - Price level; Oct. 2001

- Exchange rate:

US$ 1.0 = Rp.10,435

US$ 1.0 = J. Yen 121.92

J. Yen 1.0 = Rp.85.59

Phase 1 (NTB) :	205,896,769		52%
Phase 2 (NTT) :	188,824,599		48%
	394,721,368	33,784,201,887	100%

Table A12-3.4 (Plan 1) Estimated Cost for Consultancy Services (2/2)

Phase 2 (NTT)

Item	Unit	Q'ty	Amount F.C.(Y)	Amount L.C. (Rp.)	Total (Y)	Equiv. (Rp.)		
1. Detailed design								
1) Remuneration	M/M	37	18,430,000	44,652,000	18,951,696	1,622,075,700	31%	
- Foreign expert	M/M	21	18,430,000	0	18,430,000	1,577,423,700		
- Local expert	M/M	16	0	44,652,000	521,696	44,652,000		
2) Transportation	L.S.		10,080,000	114,225,000	11,414,560	976,972,200	19%	
3) Survey, Boring and pumping test	L.S.		3,000,000	0	3,000,000	256,770,000	5%	
4) Report binding	page	9,000	0	6,120,000	71,504	6,120,000	0%	
5) Office equipment	L.S.		0	104,300,000	1,218,600	104,300,000	2%	
6) Office running cost	month	4	0	100,000,000	1,168,361	100,000,000	2%	
7) Overhead (140% of foreign expert)	L.S.	140%	25,802,000	0	25,802,000	2,208,393,180	42%	
Total for 1.			**57,312,000**	**369,297,000**	**61,626,721**	**5,274,631,080**	100%	36%
2. Construction supervision								
1) Remuneration	M/M	75	20,338,000	177,150,000	22,407,751	1,917,879,420	35%	
- Foreign expert	M/M	21	20,338,000	0	20,338,000	1,740,729,420		
- Local expert	M/M	54	0	177,150,000	2,069,751	177,150,000		
2) Transportation	L.S.		9,000,000	225,550,000	11,635,238	995,860,000	18%	
3) Report binding	page	13,000	0	8,840,000	103,283	8,840,000	0%	
4) Office equipment	L.S.		0	16,800,000	196,285	16,800,000	0%	
5) Office running cost	month	19	0	181,000,000	2,114,733	181,000,000	3%	
6) Overhead (140% of foreign expert)	L.S.	140%	28,473,200	0	28,473,200	2,437,021,188	44%	
Total for 2.			**57,811,200**	**609,340,000**	**64,930,490**	**5,557,400,608**	100%	38%
3. Soft component services								
1) Remuneration	M/M	185	8,378,000	893,480,000	18,817,070	1,610,553,020	43%	
- Foreign expert	M/M	14	8,378,000	0	8,378,000	717,073,020		
- Local expert	M/M	171	0	893,480,000	10,439,070	893,480,000		
2) Transportation	L.S.		8,640,000	229,000,000	11,315,546	968,497,600	26%	
3) Report binding	page	16,000	0	10,880,000	127,118	10,880,000	0%	
4) Office equipment	L.S.		0	11,000,000	128,520	11,000,000	0%	
5) Office running cost	month	6	0	150,000,000	1,752,541	150,000,000	4%	
6) Overhead (140% of foreign expert)	L.S.	140%	11,729,200	0	11,729,200	1,003,902,228	27%	
Total for 3.			**28,747,200**	**1,294,360,000**	**43,869,995**	**3,754,832,848**	100%	26%
Total of 1. - 3.			**143,870,400**	**2,272,997,000**	**170,427,206**	**14,586,864,536**		100%
4. Physical Contingency		5%	7,193,520	113,649,850	8,521,360	729,343,227		
Total of 1. - 4.			**151,063,920**	**2,386,646,850**	**178,948,566**	**15,316,207,763**		
5. Price Contingency			1,510,639	715,994,055	9,876,033	845,289,647		
Total of 1. - 5.			**152,574,559**	**3,102,640,905**	**188,824,599**	**16,161,497,410**		

Note: - Price level; Oct. 2001

- Exchange rate:

US$ 1.0 = Rp.10,435

US$ 1.0 = J. Yen 121.92

J. Yen 1.0 = Rp.85.59

Phase 1 (NTB) :	205,896,769		52%
Phase 2 (NTT) :	188,824,599		48%
	394,721,368	33,784,201,887	100%

Table A12-3.5 (Plan 2) Estimated Cost for Consultancy Services (1/2)

Phase 1

Item	Unit	Q'ty	Amount F.C.(Y)	Amount L.C. (Rp.)	Total (Y)	Equiv. (Rp.)		
1. Detailed design								
1) Remuneration	M/M	37	18,430,000	44,652,000	18,951,696	1,622,075,700	29%	
- Foreign expert	M/M	21	18,430,000	0	18,430,000	1,577,423,700		
- Local expert	M/M	16	0	44,652,000	521,696	44,652,000		
2) Transportation	L.S.		10,080,000	117,764,700	11,455,917	980,511,900	18%	
3) Survey, Boring and pumping test	L.S.		6,729,000	0	6,729,000	575,935,110	10%	
4) Report binding	page	9,000	0	6,120,000	71,504	6,120,000	0%	
5) Office equipment	L.S.		0	104,300,000	1,218,600	104,300,000	2%	
6) Office running cost	month	4	0	100,000,000	1,168,361	100,000,000	2%	
7) Overhead (140% of foreign expert)	L.S.	140%	25,802,000	0	25,802,000	2,208,393,180	39%	
Total for 1.			**61,041,000**	**372,836,700**	**65,397,078**	**5,597,335,890**	100%	34%
2. Construction supervision								
1) Remuneration	M/M	73	21,540,000	170,414,000	23,531,050	2,014,022,600	34%	
- Foreign expert	M/M	22	21,540,000	0	21,540,000	1,843,608,600		
- Local expert	M/M	51	0	170,414,000	1,991,050	170,414,000		
2) Transportation	L.S.		10,080,000	284,039,200	13,398,603	1,146,786,400	19%	
3) Report binding	page	13,000	0	8,840,000	103,283	8,840,000	0%	
4) Office equipment	L.S.		0	11,200,000	130,856	11,200,000	0%	
5) Office running cost	month	14	0	203,000,000	2,371,772	203,000,000	3%	
6) Overhead (140% of foreign expert)	L.S.	140%	30,156,000	0	30,156,000	2,581,052,040	43%	
Total for 2.			**61,776,000**	**677,493,200**	**69,691,565**	**5,964,901,040**	100%	37%
3. Soft component services								
1) Remuneration	M/M	222	11,138,000	1,079,420,000	23,749,520	2,032,721,420	43%	
- Foreign expert	M/M	19	11,138,000	0	11,138,000	953,301,420		
- Local expert	M/M	203	0	1,079,420,000	12,611,520	1,079,420,000		
2) Transportation	L.S.		10,440,000	296,094,100	13,899,447	1,189,653,700	25%	
3) Report binding	page	16,000	0	10,880,000	127,118	10,880,000	0%	
4) Office equipment	L.S.		0	11,000,000	128,520	11,000,000	0%	
5) Office running cost	month	6	0	150,000,000	1,752,541	150,000,000	3%	
6) Overhead (140% of foreign expert)	L.S.	140%	15,593,200	0	15,593,200	1,334,621,988	28%	
Total for 3.			**37,171,200**	**1,547,394,100**	**55,250,346**	**4,728,877,108**	100%	29%
Total of 1. - 3.			**159,988,200**	**2,597,724,000**	**190,338,989**	**16,291,114,038**		100%
4. Physical Contingency		5%	7,999,410	129,886,200	9,516,949	814,555,702		
Total of 1. - 4.			**167,987,610**	**2,727,610,200**	**199,855,938**	**17,105,669,740**		
5. Price Contingency			1,679,876	545,522,040	8,053,542	689,302,627		
Total of 1. - 5.			**169,667,486**	**3,273,132,240**	**207,909,480**	**17,794,972,367**		

Note: - Price level; Oct. 2001

- Exchange rate:

US$ 1.0 = Rp.10,435

US$ 1.0 = J. Yen 121.92

J. Yen 1.0 = Rp.85.59

Phase-1 :	207,909,480		52%
Phase-2 :	195,634,679		48%
	403,544,159	34,539,344,569	100%

Table A12-3.5 (Plan 2) Estimated Cost for Consultancy Services (2/2)

Phase 2

Item	Unit	Q'ty	Amount F.C.(Y)	Amount L.C. (Rp.)	Total (Y)	Equiv. (Rp.)		
1. Detailed design								
1) Remuneration	M/M	37	18,430,000	44,652,000	18,951,696	1,622,075,700	31%	
- Foreign expert	M/M	21	18,430,000	0	18,430,000	1,577,423,700		
- Local expert	M/M	16	0	44,652,000	521,696	44,652,000		
2) Transportation	L.S.		10,080,000	148,142,400	11,810,838	1,010,889,600	19%	
3) Survey, Boring and pumping test	L.S.		3,000,000	0	3,000,000	256,770,000	5%	
4) Report binding	page	9,000	0	6,120,000	71,504	6,120,000	0%	
5) Office equipment	L.S.		0	104,300,000	1,218,600	104,300,000	2%	
6) Office running cost	month	4	0	100,000,000	1,168,361	100,000,000	2%	
7) Overhead (140% of foreign expert)	L.S.	140%	25,802,000	0	25,802,000	2,208,393,180	42%	
Total for 1.			**57,312,000**	**403,214,400**	**62,022,999**	**5,308,548,480**	100%	35%
2. Construction supervision								
1) Remuneration	M/M	77	19,452,000	186,878,000	21,635,409	1,851,774,680	34%	
- Foreign expert	M/M	20	19,452,000	0	19,452,000	1,664,896,680		
- Local expert	M/M	57	0	186,878,000	2,183,409	186,878,000		
2) Transportation	L.S.		8,640,000	282,310,400	11,938,404	1,021,808,000	19%	
3) Report binding	page	13,000	0	8,840,000	103,283	8,840,000	0%	
4) Office equipment	L.S.		0	16,800,000	196,285	16,800,000	0%	
5) Office running cost	month	17	0	180,000,000	2,103,049	180,000,000	3%	
6) Overhead (140% of foreign expert)	L.S.	140%	27,232,800	0	27,232,800	2,330,855,352	43%	
Total for 2.			**55,324,800**	**674,828,400**	**63,209,230**	**5,410,078,032**	100%	36%
3. Soft component services								
1) Remuneration	M/M	222	8,378,000	1,096,980,000	21,194,684	1,814,053,020	43%	
- Foreign expert	M/M	14	8,378,000	0	8,378,000	717,073,020		
- Local expert	M/M	208	0	1,096,980,000	12,816,684	1,096,980,000		
2) Transportation	L.S.		8,640,000	343,446,400	12,652,693	1,082,944,000	25%	
3) Report binding	page	16,000	0	10,880,000	127,118	10,880,000	0%	
4) Office equipment	L.S.		0	11,000,000	128,520	11,000,000	0%	
5) Office running cost	month	13	0	325,000,000	3,797,173	325,000,000	8%	
6) Overhead (140% of foreign expert)	L.S.	140%	11,729,200	0	11,729,200	1,003,902,228	24%	
Total for 3.			**28,747,200**	**1,787,306,400**	**49,629,387**	**4,247,779,248**	100%	28%
Total of 1. - 3.			**141,384,000**	**2,865,349,200**	**174,861,617**	**14,966,405,760**		100%
4. Physical Contingency		5%	7,069,200	143,267,460	8,743,081	748,320,288		
Total of 1. - 4.			**148,453,200**	**3,008,616,660**	**183,604,697**	**15,714,726,048**		
5. Price Contingency			1,484,532	902,584,998	12,029,981	1,029,646,092		
11) -								
Total of 1. - 5.			**149,937,732**	**3,911,201,658**	**195,634,679**	**16,744,372,140**		

Note: - Price level; Oct. 2001

- Exchange rate:

US$ 1.0 = Rp.10,435

US$ 1.0 = J. Yen 121.92

J. Yen 1.0 = Rp.85.59

Phase-1 :	207,909,480		52%
Phase-2 :	195,634,679		48%
	403,544,159	34,539,344,569	100%

Table A12-3.6 (Plan 1) Breakdown of Preparation Cost of Manuals for Soft Component Services (1/2)

Item	Unit	Q'ty	Rate F.C.(Y)	Rate L.C. (Rp.)	Amount F.C.(Y)	Amount L.C. (Rp.)	Total (Y)
Phase 1(NTB)							
1. Preparation of Manuals, business planning, budgeting and tariff policy							
1) Remuneration							
Foreign expert							
- Community specialist	M/M	6	552,000	0	3,312,000	0	3,312,000
- Training specialist-1	M/M	1	552,000	0	552,000	0	552,000
- Management spesialist-1	M/M	3	552,000	0	1,656,000	0	1,656,000
Sub-total for foreign expert		10			5,520,000	0	5,520,000
Local expert							
- Training specialist-2	M/M	1	0	6,500,000	0	6,500,000	75,943
- Community development specialist	M/M	1	0	5,500,000	0	5,500,000	64,260
- Community health education specialist	M/M	1	0	5,500,000	0	5,500,000	64,260
- Management spesialist-2	M/M	6	0	6,500,000	0	39,000,000	455,661
- Finance/tariff specialist	M/M	6	0	5,500,000	0	33,000,000	385,559
- Water supply planning specialist	M/M	3	0	5,500,000	0	16,500,000	192,780
- Administorator	M/M	6	0	2,440,000	0	14,640,000	171,048
Sub-total for local expert		24			0	120,640,000	1,409,510
Sub-total for 1)		**34**			**5,520,000**	**120,640,000**	**6,929,510**
2) Transportation							
- International air fare	round	3	360,000	0	1,080,000	0	1,080,000
- Local air fare (Jakaruta-Mataram)	round	6	0	1,800,000	0	10,800,000	126,183
- Local ferry fare (Mataram - Sumbawa)	round	8	0	5,000	0	40,000	467
- Allowance for foreign consultants	day	300	12,000	0	3,600,000	0	3,600,000
- Vehicle rental charge (incl. drivers)	month	6	0	4,000,000	0	24,000,000	280,407
Sub-total for 2)					**4,680,000**	**34,840,000**	**5,087,057**
3) Report binding							
- 100pages x 20vol. for TOT	page	2,000	0	680	0	1,360,000	15,890
- 5pages x 1000vol.for villagers	page	5,000	0	680	0	3,400,000	39,724
Sub-total for 3)		**7,000**			**0**	**4,760,000**	**55,614**
4) Office equipment							
- Computer	unit	2	0	5,500,000	0	11,000,000	128,520
Sub-total for 4)					**0**	**11,000,000**	**128,520**
5) Office running cost							
- Main office (Mataram)	month	3	0	25,000,000	0	75,000,000	876,271
Sub-total for 5)					**0**	**75,000,000**	**876,271**
6) Overhead (140% of foreign expert)	L.S.		140%		7,728,000	0	7,728,000
Total for 1.					**17,928,000**	**246,240,000**	**20,804,972**
2. Physical Contingency			5%	5%	**896,400**	**12,312,000**	**1,040,249**
Total of 1. - 2.					18,824,400	258,552,000	21,845,220
3. Price Contingency			1%	20%	**188,244**	**51,710,400**	**792,408**
Total of 1. - 3.					**19,012,644**	**310,262,400**	**22,637,628**

Note: - Price level; Oct. 2001

- Exchange rate:

US$ 1.0 = Rp.10,435

US$ 1.0 = J. Yen 121.92

J. Yen 1.0 = Rp.85.59

Table A12-3.6 (Plan 1) Breakdown of Preparation Cost of Manuals for Soft Component Services (2/2)

Item	Unit	Q'ty	Rate F.C.(Y)	Rate L.C. (Rp.)	Amount F.C.(Y)	Amount L.C. (Rp.)	Total (Y)
Phase 2 (NTT)							
1. Preparation of Manuals, business planning, budgeting and tariff policy							
1) Remuneration							
Foreign expert							
- Community specialist	M/M	4	552,000	0	2,208,000	0	2,208,000
- Management spesialist-1	M/M	3	552,000	0	1,656,000	0	1,656,000
Sub-total for foreign expert		7			3,864,000	0	3,864,000
Local expert							
- Community development specialist	M/M	1	0	5,500,000	0	5,500,000	64,260
- Community health education specialist	M/M	1	0	5,500,000	0	5,500,000	64,260
- Management spesialist-2	M/M	6	0	5,500,000	0	33,000,000	385,559
- Finance/tariff specialist	M/M	6	0	5,500,000	0	33,000,000	385,559
- Water supply planning specialist	M/M	3	0	5,500,000	0	16,500,000	192,780
- Administorator	M/M	6	0	2,440,000	0	14,640,000	171,048
Sub-total for local expert		23			0	108,140,000	1,263,465
Sub-total for 1)		**30**			**3,864,000**	**108,140,000**	**5,127,465**
2) Transportation							
- International air fare	round	4	360,000	0	1,440,000	0	1,440,000
- Local air fare (Jakaruta-Kupang)	round	7	0	3,600,000	0	25,200,000	294,427
- Local air fare (Kupang -Maumere)	round	10	0	830,000	0	8,300,000	96,974
- Local air fare (Kupang - Waitabula)	round	10	0	1,582,800	0	15,828,000	184,928
- Local ferry fare with 2 car (Kupang - Rote)	round	10	0	12,200	0	122,000	1,425
- Allowance for foreign consultants	day	210	12,000	0	2,520,000	0	2,520,000
- Vehicle rental charge (incl. drivers)	month	5	0	4,000,000	0	20,000,000	233,672
Sub-total for 2)					**3,960,000**	**69,450,000**	**4,771,427**
3) Report binding							
- 100pages x 20vol. for TOT	page	2,000	0	680	0	1,360,000	15,890
- 5pages x 1000vol.for villagers	page	5,000	0	680	0	3,400,000	39,724
Sub-total for 3)		**7,000**			**0**	**4,760,000**	**55,614**
4) Office equipment							
- Computer	unit	2	0	5,500,000	0	11,000,000	128,520
Sub-total for 4)					**0**	**11,000,000**	**128,520**
5) Office running cost							
- Main office (Kupang)	month	3	0	25,000,000	0	75,000,000	876,271
Sub-total for 5)					**0**	**75,000,000**	**876,271**
6) Overhead (140% of foreign expert)	L.S.		140%		5,409,600	0	5,409,600
Total for 1.					**13,233,600**	**268,350,000**	**16,368,896**
2. Physical Contingency			5%	5%	**661,680**	**13,417,500**	**818,445**
Total of 1. - 2.					13,895,280	281,767,500	17,187,341
3. Price Contingency			1%	30%	**138,953**	**84,530,250**	**1,126,571**
Total of 1. - 3.					**14,034,233**	**366,297,750**	**18,313,912**

Note: - Price level; Oct. 2001

- Exchange rate:

US$ 1.0 = Rp.10,435

US$ 1.0 = Rp.121.92

US$ 1.0 = Rp.85.59

Table A12-3.7 (Plan 2) Breakdown of Preparation Cost of Manuals for Soft Component Services (1/2)

Item	Unit	Q'ty	Rate F.C.(Y)	Rate L.C. (Rp.)	Amount F.C.(Y)	Amount L.C. (Rp.)	Total (Y)
Phase 1							
1. Preparation of Manuals, business planning, budgeting and tariff policy							
1) Remuneration							
Foreign expert							
- Community specialist	M/M	6	552,000	0	3,312,000	0	3,312,000
- Training specialist-1	M/M	1	552,000	0	552,000	0	552,000
- Management spesialist-1	M/M	3	552,000	0	1,656,000	0	1,656,000
Sub-total for foreign expert		10			5,520,000	0	5,520,000
Local expert							
- Training specialist-2	M/M	1	0	6,500,000	0	6,500,000	75,943
- Community development specialist	M/M	1	0	5,500,000	0	5,500,000	64,260
- Community health education specialist	M/M	1	0	5,500,000	0	5,500,000	64,260
- Management spesialist-2	M/M	6	0	6,500,000	0	39,000,000	455,661
- Finance/tariff specialist	M/M	6	0	5,500,000	0	33,000,000	385,559
- Water supply planning specialist	M/M	3	0	5,500,000	0	16,500,000	192,780
- Administorator	M/M	6	0	2,440,000	0	14,640,000	171,048
Sub-total for local expert		24			0	120,640,000	1,409,510
Sub-total for 1)		**34**			**5,520,000**	**120,640,000**	**6,929,510**
2) Transportation							
- International air fare	round	3	360,000	0	1,080,000	0	1,080,000
- Local air fare (Jakaruta-Mataram)	round	6	0	1,800,000	0	10,800,000	126,183
- Local air fare (Mataram -Maumere)	round	8	0	2,304,000	0	18,432,000	215,352
- Local air fare (Mataram - Kupang)	round	8	0	2,302,100	0	18,416,800	215,175
- Local ferry fare with 2 car (Kupang - Rote)	round	8	0	12,200	0	97,600	1,140
- Allowance for foreign consultants	day	300	12,000	0	3,600,000	0	3,600,000
- Vehicle rental charge (incl. drivers)	month	6	0	4,000,000	0	24,000,000	280,407
Sub-total for 2)					**4,680,000**	**71,746,400**	**5,518,257**
3) Report binding							
- 100pages x 20vol. for TOT	page	2,000	0	680	0	1,360,000	15,890
- 5pages x 1000vol.for villagers	page	5,000	0	680	0	3,400,000	39,724
Sub-total for 3)		**7,000**			**0**	**4,760,000**	**55,614**
4) Office equipment							
- Computer	unit	2	0	5,500,000	0	11,000,000	128,520
- Printer	unit	0	0	2,200,000	0	0	0
- Photo copy machine	unit	0	0	64,000,000	0	0	0
- Fax Machine	unit	0	0	5,600,000	0	0	0
- Air-conditioner	unit	0	0	4,000,000	0	0	0
Sub-total for 4)					**0**	**11,000,000**	**128,520**
5) Office running cost							
- Main office (Mataram)	month	3	0	25,000,000	0	75,000,000	876,271
Sub-total for 5)					**0**	**75,000,000**	**876,271**
6) Overhead (140% of foreign expert)	L.S.		140%		7,728,000	0	7,728,000
Total for 1.					**17,928,000**	**283,146,400**	**21,236,172**
2. Physical Contingency			5%	5%	**896,400**	**14,157,320**	**1,061,809**
Total of 1. - 2.					18,824,400	297,303,720	22,297,980
3. Price Contingency			1%	20%	**188,244**	**59,460,744**	**882,960**
Total of 1. - 3.					**19,012,644**	**356,764,464**	**23,180,940**

Note: - Price level; Oct. 2001
- Exchange rate:
US$ 1.0 = Rp.10,435
US$ 1.0 = J. Yen 121.92
J. Yen 1.0 = Rp.85.59

Table A12-3.7 (Plan 2) Breakdown of Preparation Cost of Manuals for Soft Component Services (2/2)

Item	Unit	Q'ty	Rate F.C.(Y)	Rate L.C. (Rp.)	Amount F.C.(Y)	Amount L.C. (Rp.)	Total (Y)
Phase 2							
1. Preparation of Manuals, business planning, budgeting and tariff policy							
1) Remuneration							
Foreign expert							
- Community specialist	M/M	4	552,000	0	2,208,000	0	2,208,000
- Management spesialist-1	M/M	3	552,000	0	1,656,000	0	1,656,000
Sub-total for foreign expert		7			3,864,000	0	3,864,000
Local expert							
- Community development specialist	M/M	1	0	5,500,000	0	5,500,000	64,260
- Community health education specialist	M/M	1	0	5,500,000	0	5,500,000	64,260
- Management spesialist-2	M/M	6	0	5,500,000	0	33,000,000	385,559
- Finance/tariff specialist	M/M	6	0	5,500,000	0	33,000,000	385,559
- Water supply planning specialist	M/M	3	0	5,500,000	0	16,500,000	192,780
- Administorator	M/M	6	0	2,440,000	0	14,640,000	171,048
Sub-total for local expert		23			0	108,140,000	1,263,465
Sub-total for 1)		**30**			**3,864,000**	**108,140,000**	**5,127,465**
2) Transportation							
- International air fare	round	4	360,000	0	1,440,000	0	1,440,000
- Local air fare (Jakaruta-Kupang)	round	7	0	3,600,000	0	25,200,000	294,427
- Local air fare (Kupang - Waitabula)	round	10	0	1,582,800	0	15,828,000	184,928
- Local air fare (Kupang -Sembawa Besar)	round	10	0	2,790,400	0	27,904,000	326,019
- Local air fare (Kupang - Bima)	round	10	0	1,820,400	0	18,204,000	212,688
- Allowance for foreign consultants	day	210	12,000	0	2,520,000	0	2,520,000
- Vehicle rental charge (incl. drivers)	month	5	0	4,000,000	0	20,000,000	233,672
Sub-total for 2)					**3,960,000**	**107,136,000**	**5,211,735**
3) Report binding							
- 100pages x 20vol. for TOT	page	2,000	0	680	0	1,360,000	15,890
- 5pages x 1000vol.for villagers	page	5,000	0	680	0	3,400,000	39,724
Sub-total for 3)		**7,000**			**0**	**4,760,000**	**55,614**
4) Office equipment							
- Computer	unit	2	0	5,500,000	0	11,000,000	128,520
Sub-total for 4)					**0**	**11,000,000**	**128,520**
5) Office running cost							
- Main office (Kupang)	month	3	0	25,000,000	0	75,000,000	876,271
Sub-total for 5)					**0**	**75,000,000**	**876,271**
6) Overhead (140% of foreign expert)	L.S.		140%		**5,409,600**	**0**	**5,409,600**
Total for 1.					**13,233,600**	**306,036,000**	**16,809,205**
2. Physical Contingency			5%	5%	**661,680**	**15,301,800**	**840,460**
Total of 1. - 2.					13,895,280	321,337,800	17,649,665
3. Price Contingency			1%	30%	**138,953**	**96,401,340**	**1,265,268**
Total of 1. - 3.					**14,034,233**	**417,739,140**	**18,914,933**

Note: - Price level; Oct. 2001
- Exchange rate:
US$ 1.0 = Rp.10,435
US$ 1.0 = Rp.121.92
US$ 1.0 = Rp.85.59

Table A12-3.8 (Plan 1) Estimated Administration Cost (1/2)

Phase 1 (NTB)

Item	Unit	Q'ty	Rate F.C.(Y)	Rate L.C (Rp.)	Amount F.C.(Y)	Amount L.C (Rp.)	Amount Total (Rp.)	Amount Equiv. (Y)
1. Common expenses								
1) Personnel cost								
- Preparatory stage, 1staff, 11month, half	M/M	6	0	4,000,000	0	24,000,000	24,000,000	280,407
- Construction stage, 1staff, 19month, half	M/M	10	0	4,000,000	0	40,000,000	40,000,000	467,344
- Construction stage, 1staff, 19month	M/M	19	0	4,000,000	0	76,000,000	76,000,000	887,954
- Construction stage, 4staff, 19month, half	M/M	38	0	4,000,000	0	152,000,000	152,000,000	1,775,908
Sub-total of 1)	M/M	73			0	292,000,000	292,000,000	3,411,614
2) Furniture								
- Desk and chair, bookshelf,					0	0	0	0
conference table, etc.	unit	3	0	500,000	0	1,500,000	1,500,000	17,525
Sub-total of 2)					0	1,500,000	1,500,000	17,525
3) Equipment cost								
- Computer	unit	2	0	5,500,000	0	11,000,000	11,000,000	128,520
- Photo copy machine	unit	1	0	64,000,000	0	64,000,000	64,000,000	747,751
- Leveling instrument	unit	1	0	2,500,000	0	2,500,000	2,500,000	29,209
Sub-total of 3)					0	77,500,000	77,500,000	905,480
4) Office running cost	month	8	0	25,000,000	0	200,000,000	200,000,000	2,336,722
Sub-total of 1) - 4)					0	571,000,000	571,000,000	6,671,340
5) Others	L.S.		10%	10%	0	0	0	0
Total of 1.					**0**	**571,000,000**	**571,000,000**	**6,671,340**
2. EIA cost								
- Expert-A (foreign) for 6 months	M/M	0	886,000	0	0	0	0	0
- Expert-B (foreign) for 3 months	M/M	0	886,000	0	0	0	0	0
- 2 experts (local) for 6 months	M/M	12	0	4,270,000	0	51,240,000	51,240,000	598,668
- 4 local assistants for 6 months	M/M	24	0	2,928,000	0	70,272,000	70,272,000	821,030
- International air fare	round	0	360,000	0	0	0	0	0
- Local air fare	round	12	0	1,800,000	0	21,600,000	21,600,000	252,366
- Allowance for foreign expert	day	0	12,000	0	0	0	0	0
- Vehicle rental charge (incl. drivers)	month	6	0	4,000,000	0	24,000,000	24,000,000	280,407
- Photo copy machine	unit	1	0	64,000,000	0	64,000,000	64,000,000	747,751
- Computer	unit	2	0	5,500,000	0	11,000,000	11,000,000	128,520
- Printer	unit	1	0	2,200,000	0	2,200,000	2,200,000	25,704
- Fax Machine	unit	1	0	5,600,000	0	5,600,000	5,600,000	65,428
- Report binding (100page x 30 vol.)	page	3,000	0	680	0	2,040,000	2,040,000	23,835
- Overhead (100% of foreign expert)	L.S.		140%	140%	0	0	0	0
Total for 2.					**0**	**251,952,000**	**251,952,000**	**2,943,708**
Total of 1.-2.					**0**	**822,952,000**	**822,952,000**	**9,615,048**
3. Physical Contingency			5%	5%	0	41,147,600	41,147,600	480,752
Total of 1. - 3.					**0**	**864,099,600**	**864,099,600**	**10,095,801**
4. Price Contingency			1%	20%	0	172,819,920	172,819,920	2,019,160
Total					**0**	**1,036,919,520**	**1,036,919,520**	**12,114,962**

Note: - Price level ; Oct. 2001

- Exchange rate:

US$ 1.0 = Rp.10,435

US$ 1.0 = J. Yen 121.92

J. Yen 1.0 = Rp.85.59

Phae1 (NTB) :		12,114,962
Phae2 (NTT) :		13,967,971
	2,232,438,235	26,082,933

Table A12-3.8 (Plan 1) Estimated Administration Cost (2/2)

Phase 2 (NTT)

Item	Unit	Q'ty	Rate F.C.(Y)	Rate L.C (Rp.)	Amount F.C.(Y)	Amount L.C (Rp.)	Amount Total (Rp.)	Amount Equiv. (Y)
1. Common expenses								
1) Personnel cost								
- Preparatory stage, 1staff, 3month, half	M/M	2	0	4,000,000	0	8,000,000	8,000,000	93,469
- Construction stage, 1staff, 18month, half	M/M	9	0	4,000,000	0	36,000,000	36,000,000	420,610
- Construction stage, 1staff, 18month	M/M	18	0	4,000,000	0	72,000,000	72,000,000	841,220
- Construction stage, 5staff, 18month, half	M/M	45	0	4,000,000	0	180,000,000	180,000,000	2,103,049
Sub-total of 1)	M/M	74			0	296,000,000	296,000,000	3,458,348
2) Furniture								
- Desk and chair, bookshelf,					0	0	0	0
conference table, etc.	unit	3	0	500,000	0	1,500,000	1,500,000	17,525
Sub-total of 2)					0	1,500,000	1,500,000	17,525
3) Equipment cost								
- Computer	unit	2	0	5,500,000	0	11,000,000	11,000,000	128,520
- Photo copy machine	unit	1	0	64,000,000	0	64,000,000	64,000,000	747,751
- Leveling instrument	unit	1	0	2,500,000	0	2,500,000	2,500,000	29,209
Sub-total of 3)					0	77,500,000	77,500,000	905,480
4) Office running cost	month	7	0	25,000,000	0	175,000,000	175,000,000	2,044,631
Sub-total of 1) - 4)					0	550,000,000	550,000,000	6,425,984
5) Others	L.S.		10%	10%	0	0	0	0
Total of 1.					**0**	**550,000,000**	**550,000,000**	**6,425,984**
2. EIA cost								
- Expert-A (foreign) for 6 months	M/M	0	886,000	0	0	0	0	0
- Expert-B (foreign) for 3 months	M/M	0	886,000	0	0	0	0	0
- 2 experts (local) for 6 months	M/M	12	0	4,270,000	0	51,240,000	51,240,000	598,668
- 4 local assistants for 6 months	M/M	24	0	2,928,000	0	70,272,000	70,272,000	821,030
- International air fare	round	0	360,000	0	0	0	0	0
- Local air fare	round	36	0	1,800,000	0	64,800,000	64,800,000	757,098
- Allowance for foreign expert	day	0	12,000	0	0	0	0	0
- Vehicle rental charge (incl. drivers)	month	12	0	4,000,000	0	48,000,000	48,000,000	560,813
- Photo copy machine	unit	1	0	64,000,000	0	64,000,000	64,000,000	747,751
- Computer	unit	2	0	5,500,000	0	11,000,000	11,000,000	128,520
- Printer	unit	1	0	2,200,000	0	2,200,000	2,200,000	25,704
- Fax Machine	unit	1	0	5,600,000	0	5,600,000	5,600,000	65,428
- Report binding (100page x 30 vol.)	page	3,000	0	680	0	2,040,000	2,040,000	23,835
- Overhead (100% of foreign expert)	L.S.		140%	140%	0	0	0	0
Total for 2.					**0**	**319,152,000**	**319,152,000**	**3,728,847**
Total of 1.-2.					**0**	**869,152,000**	**869,152,000**	**10,154,831**
3. Physical Contingency			5%	5%	0	43,457,600	43,457,600	507,742
Total of 1. - 3.					**0**	**912,609,600**	**912,609,600**	**10,662,573**
4. Price Contingency			1%	31%	0	282,908,976	282,908,976	3,305,398
Total					**0**	**1,195,518,576**	**1,195,518,576**	**13,967,971**

Note: - Price level ; Oct. 2001

- Exchange rate:

US$ 1.0 = Rp.10,435

US$ 1.0 = J. Yen 121.92

J. Yen 1.0 = Rp.85.59

Phae1 (NTB) :		12,114,962
Phae2 (NTT) :		13,967,971
	2,232,438,235	26,082,933

Table A12-3.9 (Plan 2) Estimated Administration Cost (1/2)

Phase 1

Item	Unit	Q'ty	Rate F.C.(Y)	Rate L.C (Rp.)	Amount F.C.(Y)	Amount L.C (Rp.)	Amount Total (Rp.)	Amount Equiv. (Y)
1. Common expenses								
1) Personnel cost								
- Preparatory stage, 1staff, 11month, half	M/M	6	0	4,000,000	0	24,000,000	24,000,000	280,407
- Construction stage, 1staff, 19month	M/M	19	0	4,000,000	0	76,000,000	76,000,000	887,954
- Construction stage, 2staff, 19month	M/M	38	0	4,000,000	0	152,000,000	152,000,000	1,775,908
- Construction stage, 4staff, 19month, half	M/M	38	0	4,000,000	0	152,000,000	152,000,000	1,775,908
Sub-total of 1)	M/M	101			0	404,000,000	404,000,000	4,720,178
2) Furniture								
- Desk and chair, bookshelf,					0	0	0	0
conference table, etc.	unit	3	0	500,000	0	1,500,000	1,500,000	17,525
Sub-total of 2)					0	1,500,000	1,500,000	17,525
3) Equipment cost								
- Computer	unit	2	0	5,500,000	0	11,000,000	11,000,000	128,520
- Photo copy machine	unit	1	0	64,000,000	0	64,000,000	64,000,000	747,751
- Leveling instrument	unit	1	0	2,500,000	0	2,500,000	2,500,000	29,209
Sub-total of 3)					0	77,500,000	77,500,000	905,480
4) Office running cost	month	8	0	25,000,000	0	200,000,000	200,000,000	2,336,722
Sub-total of 1) - 4)					0	683,000,000	683,000,000	7,979,904
5) Others	L.S.		10%	10%	0	0	0	0
Total of 1.					**0**	**683,000,000**	**683,000,000**	**7,979,904**
2. EIA cost								
- Expert-A (foreign) for 6 months	M/M	0	886,000	0	0	0	0	0
- Expert-B (foreign) for 3 months	M/M	0	886,000	0	0	0	0	0
- 2 experts (local) for 6 months	M/M	12	0	4,270,000	0	51,240,000	51,240,000	598,668
- 4 local assistants for 6 months	M/M	24	0	2,928,000	0	70,272,000	70,272,000	821,030
- International air fare	round	0	360,000	0	0	0	0	0
- Local air fare	round	12	0	1,800,000	0	21,600,000	21,600,000	252,366
- Allowance for foreign expert	day	0	12,000	0	0	0	0	0
- Vehicle rental charge (incl. drivers)	month	6	0	4,000,000	0	24,000,000	24,000,000	280,407
- Photo copy machine	unit	1	0	64,000,000	0	64,000,000	64,000,000	747,751
- Computer	unit	2	0	5,500,000	0	11,000,000	11,000,000	128,520
- Printer	unit	1	0	2,200,000	0	2,200,000	2,200,000	25,704
- Fax Machine	unit	1	0	5,600,000	0	5,600,000	5,600,000	65,428
- Report binding (100page x 30 vol.)	page	3,000	0	680	0	2,040,000	2,040,000	23,835
- Overhead (100% of foreign expert)	L.S.		140%	140%	0	0	0	0
Total for 2.					**0**	**251,952,000**	**251,952,000**	**2,943,708**
Total of 1.-2.					**0**	**934,952,000**	**934,952,000**	**10,923,613**
3. Physical Contingency			5%	5%	0	46,747,600	46,747,600	546,181
Total of 1. - 3.					**0**	**981,699,600**	**981,699,600**	**11,469,793**
4. Price Contingency			1%	20%	0	196,339,920	196,339,920	2,293,959
Total					**0**	**1,178,039,520**	**1,178,039,520**	**13,763,752**

Note: - Price level ; Oct. 2001
- Exchange rate:
US$ 1.0 = Rp.10,435
US$ 1.0 = J. Yen 121.92
J. Yen 1.0 = Rp.85.59

Phae 1:		13,763,752
Phae 2:		15,703,617
	2,522,112,113	29,467,369

Table A12-3.9 (Plan 2) Estimated Administration Cost (2/2)

Phase 2

Item	Unit	Q'ty	Rate F.C.(Y)	Rate L.C (Rp.)	Amount F.C.(Y)	Amount L.C (Rp.)	Amount Total (Rp.)	Amount Equiv. (Y)
1. Common expenses								
1) Personnel cost								
- Preparatory stage, 1staff, 3month, half	M/M	2	0	4,000,000	0	8,000,000	8,000,000	93,469
- Construction stage, 1staff, 18month	M/M	18	0	4,000,000	0	72,000,000	72,000,000	841,220
- Construction stage, 2staff, 18month	M/M	36	0	4,000,000	0	144,000,000	144,000,000	1,682,440
- Construction stage, 5staff, 18month, half	M/M	45	0	4,000,000	0	180,000,000	180,000,000	2,103,049
Sub-total of 1)	M/M	101			0	404,000,000	404,000,000	4,720,178
2) Furniture								
- Desk and chair, bookshelf,					0	0	0	0
conference table, etc.	unit	3	0	500,000	0	1,500,000	1,500,000	17,525
Sub-total of 2)					0	1,500,000	1,500,000	17,525
3) Equipment cost								
- Computer	unit	2	0	5,500,000	0	11,000,000	11,000,000	128,520
- Photo copy machine	unit	1	0	64,000,000	0	64,000,000	64,000,000	747,751
- Leveling instrument	unit	1	0	2,500,000	0	2,500,000	2,500,000	29,209
Sub-total of 3)					0	77,500,000	77,500,000	905,480
4) Office running cost	month	7	0	25,000,000	0	175,000,000	175,000,000	2,044,631
Sub-total of 1) - 4)					0	658,000,000	658,000,000	7,687,814
5) Others	L.S.		10%	10%	0	0	0	0
Total of 1.					**0**	**658,000,000**	**658,000,000**	**7,687,814**
2. EIA cost								
- Expert-A (foreign) for 6 months	M/M	0	886,000	0	0	0	0	0
- Expert-B (foreign) for 3 months	M/M	0	886,000	0	0	0	0	0
- 2 experts (local) for 6 months	M/M	12	0	4,270,000	0	51,240,000	51,240,000	598,668
- 4 local assistants for 6 months	M/M	24	0	2,928,000	0	70,272,000	70,272,000	821,030
- International air fare	round	0	360,000	0	0	0	0	0
- Local air fare	round	36	0	1,800,000	0	64,800,000	64,800,000	757,098
- Allowance for foreign expert	day	0	12,000	0	0	0	0	0
- Vehicle rental charge (incl. drivers)	month	12	0	4,000,000	0	48,000,000	48,000,000	560,813
- Photo copy machine	unit	1	0	64,000,000	0	64,000,000	64,000,000	747,751
- Computer	unit	2	0	5,500,000	0	11,000,000	11,000,000	128,520
- Printer	unit	1	0	2,200,000	0	2,200,000	2,200,000	25,704
- Fax Machine	unit	1	0	5,600,000	0	5,600,000	5,600,000	65,428
- Report binding (100page x 30 vol.)	page	3,000	0	680	0	2,040,000	2,040,000	23,835
- Overhead (100% of foreign expert)	L.S.		140%	140%	0	0	0	0
Total for 2.					**0**	**319,152,000**	**319,152,000**	**3,728,847**
Total of 1.-2.					**0**	**977,152,000**	**977,152,000**	**11,416,661**
3. Physical Contingency			5%	5%	0	48,857,600	48,857,600	570,833
Total of 1. - 3.					**0**	**1,026,009,600**	**1,026,009,600**	**11,987,494**
4. Price Contingency			1%	31%	0	318,062,976	318,062,976	3,716,123
Total					**0**	**1,344,072,576**	**1,344,072,576**	**15,703,617**

Note: - Price level ; Oct. 2001

- Exchange rate:

US$ 1.0 = Rp.10,435

US$ 1.0 = J. Yen 121.92

J. Yen 1.0 = Rp.85.59

Phae 1:		13,763,752
Phae 2:		15,703,617
	2,522,112,113	29,467,369

Table A12-3.10 (Plan 1) Estimated Project Cost

(unit: Y, thousand or Rp., thousand)

Cost Item	Foreign portion				Local portion	*Equivalent*	Total	*Equivalent*
	F.C. (Y)	L.C. (Rp.)	Total (Y)	*Equiv. (Rp.)*	(Rp.)	*(Y)*	(Y)	*(Rp.)*
Phase1 (NTB)								
1) Construction cost	43,684	20,504,718	283,253	*24,243,633*	1,578,380	*18,441*	301,694	*25,822,013*
2) Consultancy services cost	168,904	3,166,217	205,897	*17,622,704*	0	*0*	205,897	*17,622,704*
3) Administration cost	0	0	0	*0*	1,036,920	*12,115*	12,115	*1,036,920*
4) Land acquisition cost	0	0	0	*0*	6,526	*76*	76	*6,526*
5) Taxes and duties	0	0	0	*0*	157,838	*1,844*	1,844	*157,838*
Total for Phase1 (NTB)	**212,588**	**23,670,936**	**489,150**	***41,866,338***	**2,779,663**	***32,476***	**521,626**	***44,646,001***
Phase2 (NTT)								
1) Construction cost	46,669	15,372,725	226,278	*19,367,123*	933,740	*10,909*	237,187	*20,300,863*
2) Consultancy services cost	152,575	3,102,641	188,825	*16,161,497*	0	*0*	188,825	*16,161,497*
3) Administration cost	0	0	0	*0*	1,195,519	*13,968*	13,968	*1,195,519*
4) Land acquisition cost	0	0	0	*0*	2,930	*34*	34	*2,930*
5) Taxes and duties	0	0	0	*0*	93,374	*1,091*	1,091	*93,374*
Total for Phase2 (NTT)	**199,244**	**18,475,366**	**415,102**	***35,528,620***	**2,225,562**	***26,003***	**441,105**	***37,754,182***
Phase1 (NTB) + Phase2 (NTT)								
1 Construction cost	90,353	35,877,443	509,531	*43,610,756*	2,512,120	*29,351*	538,882	*46,122,876*
2 Consultancy services cost	321,478	6,268,858	394,721	*33,784,202*	0	*0*	394,721	*33,784,202*
3 Administration cost	0	0	0	*0*	2,232,438	*26,083*	26,083	*2,232,438*
4 Land acquisition cost	0	0	0	*0*	9,456	*110*	110	*9,456*
5 Taxes and duties	0	0	0	*0*	251,212	*2,935*	2,935	*251,212*
Project cost	**411,831**	**42,146,302**	**904,252**	***77,394,958***	**5,005,226**	***58,479***	**962,731**	***82,400,183***

Note: - Price level ; Oct. 2001
US$ 1.0 = Rp.10,435
US$ 1.0 = J. Yen 121.92
J. Yen 1.0 = Rp.85.59

- Foreign portion: Amount that may be financed by foreign assistant agency
- Local portion: Amount that would be borne by the Government of Indonesia

Table A12-3.11 (Plan 2) Estimated Project Cost

(unit: Y, thousand or Rp., thousand)

Cost Item	Foreign portion				Local portion	*Equivalent*	otal	*Equivalent*
	F.C. (Y)	L.C. (Rp.)	Total (Y)	*Equiv. (Rp.)*	(Rp.)	*(Y)*	(Y)	*(Rp.)*
Phase1								
1) Construction cost	43,684	18,441,786	259,151	*22,180,701*	1,476,953	*17,256*	276,407	*23,657,654*
2) Consultancy services cost	169,667	3,273,132	207,909	*17,794,972*	0	*0*	207,909	*17,794,972*
3) Administration cost	0	0	0	*0*	1,178,040	*13,764*	13,764	*1,178,040*
4) Land acquisition cost	0	0	0	*0*	6,172	*72*	72	*6,172*
5) Taxes and duties	0	0	0	*0*	147,695	*1,726*	1,726	*147,695*
Total for Phase1	**213,352**	**21,714,918**	**467,060**	***39,975,673***	**2,808,860**	***32,818***	**499,878**	***42,784,533***
Phase2								
1) Construction cost	46,669	17,836,167	255,060	*21,830,565*	1,043,346	*12,190*	267,250	*22,873,911*
2) Consultancy services cost	149,938	3,911,202	195,635	*16,744,372*	0	*0*	195,635	*16,744,372*
3) Administration cost	0	0	0	*0*	1,344,073	*15,704*	15,704	*1,344,073*
4) Land acquisition cost	0	0	0	*0*	3,324	*39*	39	*3,324*
5) Taxes and duties	0	0	0	*0*	104,335	*1,219*	1,219	*104,335*
Total for Phase2	**196,607**	**21,747,369**	**450,694**	***38,574,937***	**2,495,077**	***29,151***	**479,846**	***41,070,014***
Phase1 + Phase2								
1 Construction cost	90,353	36,277,953	514,210	*44,011,266*	2,520,299	*29,446*	543,657	*46,531,565*
2 Consultancy services cost	319,605	7,184,334	403,544	*34,539,345*	0	*0*	403,544	*34,539,345*
3 Administration cost	0	0	0	*0*	2,522,112	*29,467*	29,467	*2,522,112*
4 Land acquisition cost	0	0	0	*0*	9,496	*111*	111	*9,496*
5 Taxes and duties	0	0	0	*0*	252,030	*2,945*	2,945	*252,030*
Project cost	**409,958**	**43,462,287**	**917,755**	***78,550,610***	**5,303,937**	***61,969***	**979,724**	***83,854,547***

Note: - Price level ; Oct. 2001
US$ 1.0 = Rp.10,435
US$ 1.0 = J. Yen 121.92
J. Yen 1.0 = Rp.85.59
- Foreign portion: Amount that may be financed by foreign assistant agency
- Local portion: Amount that would be borne by the Government of Indonesia

Table A12-4.1 Estimated Annual O&M Cost (1/3)

Serial No.	JICA #	Name of village	Design pop. (Nr.)	Nr. of house-holds (Nr.)	Source*1	O&M type*2	Type of pump*3 (Nr.)	Output capacity (kW)	Output capacity (HP)	Diesel engine Capa. (HP)	Diesel engine Q'ty (Nr.)	Fuel type*4	Salary and allowance: Villagers Q'ty (M)	Villagers Rate (Rp.)	Villagers Amount(1) (Rp., thous.)	PDAM staff Q'ty (m.m)	PDAM staff Rate (Rp.)	PDAM staff Amount(2) (Rp., thous.)	Chemical Q'ty (kg)	Chemical Rate (Rp.)	Chemical Amount(3) (Rp., thous.)
NTB				①																	
Lombok																					
1/	NTB 1.	Kuranji	1,894	379	E	(A)	-	-	-	-	-	-	12	26,000	312	12	440,000	5,280	108	12,000	1,296
2/	NTB 2.	Bajur	6,130	1,226	E	(A)	-	-	-	-	-	-	12	26,000	312	12	440,000	5,280	375	12,000	4,500
3/	NTB 3.	Sembung	2,225	445	E	(A)	-	-	-	-	-	-	12	26,000	312	12	440,000	5,280	127	12,000	1,524
4/	NTB 4a.	Duman, upper	3,078	616	Sp	(C)	-	-	-	-	-	-	12	68,000	816	-	440,000	-	162	12,000	1,944
5/	NTB 4b.	Duman, lower	1,926	386	E	(A)	-	-	-	-	-	-	12	26,000	312	12	440,000	5,280	110	12,000	1,320
6/	NTB 10.	Bagik Papan	3,182	637	E (Sp)	(C)	-	-	-	-	-	-	12	68,000	816	-	440,000	-	168	12,000	2,016
7/	NTB 11.	Selaparang	3,433	687	E (Sp)	(A)	-	-	-	-	-	-	12	26,000	312	24	440,000	10,560	271	12,000	3,252
Sumbawa																					
8/	NTB 13.	Lb. Mapin	3,570	714	Sp	(A)	-	-	-	-	-	-	12	26,000	312	12	440,000	5,280	274	12,000	3,288
9/	NTB 14.	Lb. Lalar	3,136	628	TW	(B)	ES	4.0	5.5	-	-	e	12	68,000	816	1	440,000	440	179	12,000	2,148
10/	NTB 16.	Piong	1,662	333	TW	(B)	ES	1.5	2.0	-	-	e	12	68,000	816	1	440,000	440	102	12,000	1,224
11/	NTB 18a.	Kawuwu, lower	414	83	SW	(B)	ES	1.5	2.0	-	-	e	12	68,000	816	1	440,000	440	22	12,000	264
12/	NTB 18b.	Kawuwu, upper	404	81	E (Sp)	(C)	-	-	-	-	-	-	12	68,000	816	-	440,000	-	18	12,000	216
	Sub-total for NTB		31,054	6,215							-		(144)		6,768	(87)		38,280	(1,916)		22,992
NTT																					
Flores																					
13/	NTT 6.	Sinar Hading	1,294	259	NTT 7.	(A)	-	-	-	-	-	-	12	26,000	312	12	440,000	5,280	103	12,000	1,236
14/	NTT 7.	Ile Padung	1,122	225	Sp	(A)	CV	2.2	3.0	10	2	d	12	26,000	312	18	440,000	7,920	89	12,000	1,068
						(A)	CV	0.4	0.5	2	2	d	12	26,000	312	-	440,000	-	-	12,000	-
Sumba																					
15/	NTT 18.	Weerame	1,616	324	CW	(B)	CV	2.2	3.0	10	2	d	12	68,000	816	1	440,000	440	128	12,000	1,536
16/	NTT 19.	Kondamara	1,828	366	E (Sp)	(B)	CV	2.2	3.0	10	2	d	12	68,000	816	1	440,000	440	91	12,000	1,092
Rote																					
17/	NTT 21.	Oebau	632	127	CW	(B)	CV	0.8	1.0	2	1	d	12	68,000	816	1	440,000	440	31	12,000	372
18/	NTT 23.	Nusakdale	450	90	Sp	(C)	-	-	-	-	-	-	12	68,000	816	-	440,000	-	22	12,000	264
Timor																					
19/	NTT 24.	Tarus	3,977	796	E (Sp)	(A)	ES	7.5	10.2	-	-	e	12	26,000	312	24	440,000	10,560	314	12,000	3,768
						(A)	CV	7.5	10.2	10	2	d									
	Sub-total for NTT		10,919	2,187							11		(252)		4,512	(57)		25,080	(778)		9,336
Total of NTB and NTT			**41,973**	**8,402**							**11**		**(396)**		**11,280**	**(144)**		**63,360**	**(2,694)**		**32,328**
Note:															6%			35%			18%

- Price level: October 2001
- Exchange rate:

US$ 1.0= Y 121.92
US$ 1.0= Rp. 10,435
Y 1.0= Rp. 85.59

*1: E: existing water supply sytem. Sp: spring.
E (Sp) means that the works will require tapping or diverting from an existing system that has the water source of spring.
TW: tube well. SW: shallow well. CW: cavern water.

*2: (A): PDAM will be responsible for O&M of water supplies.
(B): Villages will be responsible for O&M of water supplies with support provided by PDAM.
(C): Villages will be responsible for O&M of water supplies.

Monthly rate by O&M type:
(A) 26,000
(B) 68,000
(C) 68,000

*3: ES: Electrical submergible pump
CV: Centrifugal volute pump

*4: e: electric power; Rate: 260 /kWh
d: light oil; Rate: 900 /lit

Table A12-4.1 Estimated Annual O&M Cost (2/3)

Serial No.	JICA #	Name of village	Design pop.	Nr. of house-holds	Source*1	O&M type*2	Electricity Q'ty*5	Electricity Rate	Electricity Amount(4)	Light oil Q'ty*6	Light oil Rate	Light oil Amount(5)	Maintenance and repair cost: Base price	Pump Q'ty	Standard life	Repair rate*7	Amount(6)	Σ{Amount (1) to (6)} Sub-total	Other expenses 5%	Annual total by village
			(Nr.)	(Nr.)			(kWh)	(Rp.)	(Rp., thous.)	(lit)	(Rp.)	(Rp., thous.)	(Rp., thous.)	(Nr.)	(Year)	(%)	(Rp., thous.)	(Rp., thous.)	(Rp., thous.)	(Rp., thous.)
NTB				①																
Lombok																				
1/	NTB 1.	Kuranji	1,894	379	E	(A)	-	-	-	-	-	-	-	-	15.0	100%	-	6,888	344	7,232
2/	NTB 2.	Bajur	6,130	1,226	E	(A)	-	-	-	-	-	-	-	-	15.0	100%	-	10,092	505	10,597
3/	NTB 3.	Sembung	2,225	445	E	(A)	-	-	-	-	-	-	-	-	15.0	100%	-	7,116	356	7,472
4/	NTB 4a.	Duman, upper	3,078	616	Sp	(C)	-	-	-	-	-	-	-	-	15.0	100%	-	2,760	138	2,898
5/	NTB 4b.	Duman, lower	1,926	386	E	(A)	-	-	-	-	-	-	-	-	15.0	100%	-	6,912	346	7,258
6/	NTB 10.	Bagik Papan	3,182	637	E (Sp)	(C)	-	-	-	-	-	-	-	-	15.0	100%	-	2,832	142	2,974
7/	NTB 11.	Selaparang	3,433	687	E (Sp)	(A)	-	-	-	-	-	-	-	-	15.0	100%	-	14,124	706	14,830
Sumbawa																				
8/	NTB 13.	Lb. Mapin	3,570	714	Sp	(A)	-	-	-	-	-	-	-	-	15.0	100%	-	8,880	444	9,324
9/	NTB 14.	Lb. Lalar	3,136	628	TW	(B)	21,024	260	5,466	-	-	-	35,500	1	15.0	100%	2,367	11,237	562	11,799
10/	NTB 16.	Piong	1,662	333	TW	(B)	7,884	260	2,050	-	-	-	19,386	1	15.0	100%	1,292	5,822	291	6,113
11/	NTB 18a.	Kawuwu, lower	414	83	SW	(B)	5,256	260	1,367	-	-	-	19,386	1	15.0	100%	1,292	4,179	209	4,388
12/	NTB 18b.	Kawuwu, upper	404	81	E (Sp)	(C)	-	-	-	-	-	-	-	-	15.0	100%	-	1,032	52	1,084
	Sub-total for NTB		31,054	6,215			(34,164)		8,883	(0)		-		(3)			4,951	81,874	4,095	85,969
NTT																				
Flores																				
13/	NTT 6.	Sinar Hading	1,294	259	NTT 7.	(A)	-	-	-	-	-	-	-	-	15.0	100%	-	6,828	341	7,169
14/	NTT 7.	Ile Padung	1,122	225	Sp	(A)	-	-	-	7,140	900	6,426	11,508	2	15.0	100%	1,534	17,260	863	21,289
						(A)	-	-	-	1,730	900	1,557	8,593	2	15.0	100%	1,146	3,015	151	
Sumba																				
15/	NTT 18.	Weerame	1,616	324	CW	(B)	-	-	-	7,140	900	6,426	11,508	2	15.0	100%	1,534	10,752	538	11,290
16/	NTT 19.	Kondamara	1,828	366	E (Sp)	(B)	-	-	-	7,140	900	6,426	11,508	2	15.0	100%	1,534	10,308	515	10,823
Rote																				
17/	NTT 21.	Oebau	632	127	CW	(B)	-	-	-	1,300	900	1,170	8,593	1	15.0	100%	573	3,371	169	3,540
18/	NTT 23.	Nusakdale	450	90	Sp	(C)	-	-	-	-	-	-	-	-	15.0	100%	-	1,080	54	1,134
Timor																				
19/	NTT 24.	Tarus	3,977	796	E (Sp)	(A)	5,256	260	1,367	-	-	-	18,915	2	15.0	100%	2,522	18,529	926	37,629
						(A)	-	-	-	16,430	900	14,787	18,915	2	15.0	100%	2,522	17,309	865	
	Sub-total for NTT		10,919	2,187			(5,256)		1,367	(40,880)		36,792		(13)			11,365	88,452	4,422	92,874
Total of NTB and NTT			**41,973**	**8,402**			**(39,420)**		**10,250**	**(40,880)**		**36,792**		**(16)**			**16,316**	**170,326**	**8,517**	**178,843**
Note:									6%			21%					9%		5%	100%

- Price level: October 2001
- Exchange rate:
  US$ 1.0= Y 121.92
  US$ 1.0= Rp. 10,435
  Y 1.0= Rp. 85.59

*5: Electricity's quantity includes about 30% of extra.
*6: Light oil's quantity includes about 30% of extra.
*7: The value indicates the rate of total maintenance and repair cost against the base price of equipment for the whole of the standard life.

Table A12-4.1 Estimated Annual O&M Cost (3/3)

Serial No.	JICA #	Name of village	Design pop.	Nr. of house-holds	Source*1	O&M type*2	Annual total by system*8	per house-hold	Annual O&M cost by type			Annual O&M cost per household by type			Monthly O&M cost per household by type		
									(A)	(B)	(C)	(A)	(B)	(C)	(A)	(B)	(C)
			(Nr.)	(Nr.)			(Rp., thous.)	(Rp.)	(Rp., thous.)	(Rp., thous.)	(Rp., thous.)	(Rp.)	(Rp.)	(Rp.)	(Rp.)	(Rp.)	(Rp.)
NTB				①			②	②/①									
Lombok																	
1/	NTB 1.	Kuranji	1,894	379	E	(A)	7,232	19,082	7,232	-	-	19,082	-	-	1,590	-	-
2/	NTB 2.	Bajur	6,130	1,226	E	(A)	10,597	8,644	10,597	-	-	8,644	-	-	720	-	-
3/	NTB 3.	Sembung	2,225	445	E	(A)	7,472	16,791	7,472	-	-	16,791	-	-	1,399	-	-
4/	NTB 4a.	Duman, upper	3,078	616	Sp	(C)	2,898	4,705	-	-	2,898	-	-	4,705	-	-	392
5/	NTB 4b.	Duman, lower	1,926	386	E	(A)	7,258	18,803	7,258	-	-	18,803	-	-	1,567	-	-
6/	NTB 10.	Bagik Papan	3,182	637	E (Sp)	(C)	2,974	4,669	-	-	2,974	-	-	4,669	-	-	389
7/	NTB 11.	Selaparang	3,433	687	E (Sp)	(A)	14,830	21,587	14,830	-	-	21,587	-	-	1,799	-	-
Sumbawa																	
8/	NTB 13.	Lb. Mapin	3,570	714	Sp	(A)	9,324	13,059	9,324	-	-	13,059	-	-	1,088	-	-
9/	NTB 14.	Lb. Lalar	3,136	628	TW	(B)	11,799	18,788	-	11,799	-	-	18,788	-	-	1,566	-
10/	NTB 16.	Piong	1,662	333	TW	(B)	6,113	18,357	-	6,113	-	-	18,357	-	-	1,530	-
11/	NTB 18a.	Kawuwu, lower	414	83	SW	(B)	4,388	52,867	-	4,388	-	-	52,867	-	-	4,406	-
12/	NTB 18b.	Kawuwu, upper	404	81	E (Sp)	(C)	1,084	13,383	-	-	1,084	-	-	13,383	-	-	1,115
	Sub-total for NTB		31,054	6,215			85,969	13,833	56,713	22,300	6,956	14,781	21,360	5,214	1,232	1,780	435
NTT																	
Flores																	
13/	NTT 6.	Sinar Hading	1,294	259	NTT 7.	(A)	28,458	58,798	28,458	-	-	58,798	-	-	4,900	-	-
14/	NTT 7.	Ile Padung	1,122	225	Sp	(A)											
						(A)											
Sumba																	
15/	NTT 18.	Weerame	1,616	324	CW	(B)	11,290	34,846	-	11,290	-	-	34,846	-	-	2,904	-
16/	NTT 19.	Kondamara	1,828	366	E (Sp)	(B)	10,823	29,571	-	10,823	-	-	29,571	-	-	2,464	-
Rote																	
17/	NTT 21.	Oebau	632	127	CW	(B)	3,540	27,874	-	3,540	-	-	27,874	-	-	2,323	-
18/	NTT 23.	Nusakdale	450	90	Sp	(C)	1,134	12,600	-	-	1,134	-	-	12,600	-	-	1,050
Timor																	
19/	NTT 24.	Tarus	3,977	796	E (Sp)	(A)	37,629	47,273	37,629	-	-	47,273	-	-	3,939	-	-
						(A)											
	Sub-total for NTT		10,919	2,187			92,874	42,466	66,087	25,653	1,134	51,630	31,399	12,600	4,303	2,617	1,050
Total of NTB and NTT			**41,973**	**8,402**			**178,843**	**21,286**	**122,800**	**47,953**	**8,090**	**23,998**	**25,767**	**5,681**	**2,000**	**2,147**	**473**
Note:							(Y, thous.)	(Y)	(Y, thous.)	(Y, thous.)	(Y, thous.)	(Y)	(Y)	(Y)	(Y)	(Y)	(Y)
- Price level: October 2001							2,090	249	1,435	560	95	280	301	66	23	25	6

- Exchange rate:

US$ 1.0= Y 121.92

US$ 1.0= Rp. 10,435

Y 1.0= Rp. 85.59

*8: The villages of Sinar Hading and Ile Padung are combined to compute the cost since they are to operate a common water system.

Table A12-4.2 Estimated Replacement Cost

Serial No.	JICA #	Name of village	Design pop. (Nr.)	Nr. of house-holds (Nr.)	Source*1	O&M type*2	Pumps: Submer-sible (Nr.)	Pumps: centri-fugal (Nr.)	Replacement rate: Submer-sible (Rp., thous.)	Replacement rate: centri-fugal (Rp., thous.)	Amount: Submer-sible (Rp., thous.)	Amount: centri-fugal (Rp., thous.)	Amount: Total*3 (Rp., thous.)	per household: per annum (Rp.)	per household: per month (Rp.)
NTB															
Lombok															
1/	NTB 1.	Kuranji	1,894	379	E	(A)	-	-	-	-	-	-	-	-	-
2/	NTB 2.	Bajur	6,130	1,226	E	(A)	-	-	-	-	-	-	-	-	-
3/	NTB 3.	Sembung	2,225	445	E	(A)	-	-	-	-	-	-	-	-	-
4/	NTB 4a.	Duman, upper	3,078	616	Sp	(C)	-	-	-	-	-	-	-	-	-
5/	NTB 4b.	Duman, lower	1,926	386	E	(A)	-	-	-	-	-	-	-	-	-
6/	NTB 10.	Bagik Papan	3,182	637	E (Sp)	(C)	-	-	-	-	-	-	-	-	-
7/	NTB 11.	Selaparang	3,433	687	E (Sp)	(A)	-	-	-	-	-	-	-	-	-
Sumbawa															
8/	NTB 13.	Lb. Mapin	3,570	714	Sp	(A)	-	-	-	-	-	-	-	-	-
9/	NTB 14.	Lb. Lalar	3,136	628	TW	(B)	1	-	35,500	-	35,500	-	35,500	3,769	314
10/	NTB 16.	Piong	1,662	333	TW	(B)	1	-	19,386	-	19,386	-	19,386	3,881	323
11/	NTB 18a.	Kawuwu, lower	414	83	SW	(B)	1	-	19,386	-	19,386	-	19,386	15,571	1,298
12/	NTB 18b.	Kawuwu, upper	404	81	E (Sp)	(C)	-	-	-	-	-	-	-	-	-
Sub-total for NTB			31,054	6,215			3	-			74,272	-	74,272	4,743	395
NTT															
Flores															
13/	NTT 6.	Sinar Hading	1,294	259	NTT 7.	(A)	-	-	-	-	-	-	180,908	24,918	2,077
14/	NTT 7.	Ile Padung	1,122	225	Sp	(A)	-	4	-	45,227	-	180,908			
Sumba															
15/	NTT 18.	Weerame	1,616	324	CW	(B)	-	2	-	25,893	-	51,786	51,786	10,656	888
16/	NTT 19.	Kondamara	1,828	366	E (Sp)	(B)	-	2	-	25,893	-	51,786	51,786	9,433	786
Rote															
17/	NTT 21.	Oebau	632	127	CW	(B)	-	1	-	19,334	-	19,334	19,334	10,149	846
18/	NTT 23.	Nusakdale	450	90	Sp	(C)	-	-	-	-	-	-	-	-	-
Timor															
19/	NTT 24.	Tarus	3,977	796	E (Sp)	(A)	2	2	18,915	42,559	37,830	85,118	122,948	10,297	858
Sub-total for NTT			10,919	2,187			2	11			37,830	388,932	426,762	13,567	1,131
Total of NTB and NTT			**41,973**	**8,402**			**5**	**11**			**112,102**	**388,932**	**501,034**	**10,634**	**886**
													(Y, thous.)	(Y)	(Y)
													5,854	124	10

Note:

- Price level: October 2001
- Exchange rate:

US$ 1.0= Y 121.92
US$ 1.0= Rp. 10,435
Y 1.0= Rp. 85.59

*1: E: existing water supply sytem. Sp: spring.
E (Sp) means that the works will require tapping or diverting from an existing system that has the water source of spring.
TW: tube well. SW: shallow well. CW: cavern water.

*2: (A): PDAM will be responsible for O&M of water supplies.
(B): Villages will be responsible for O&M of water supplies with support provided by PDAM.
(C): Villages will be responsible for O&M of water supplies.

*3: The replacement cost will be required at a cycle of every 15 years. The villages of Sinar Hading and Ile Padung are combined to compute the cost since they are to operate a common water system.