

2-3 Obligations of the Government of Timor-Leste

In order to secure smooth project implementation and operation and maintenance, obligations of the measures to be undertaken by the Government of Timor-Leste during preparation, procurement of equipment, construction and operation and maintenance under the Grant Aid Project is outlined as follows.

(1) General

- 1) To secure lands necessary for the facilities to be constructed and installation of the materials and equipment,
- 2) To provide facilities of electricity and others needed for the Project implementation at outside the sites,
- 3) To bear the necessary commission to the bank based on the Banking Arrangement,
- 4) To ensure prompt execution of un-loading and customs clearance for the materials and equipment to be brought into under the Project,
- 5) To exempt Japanese nationals from customs duties, internal taxes, and other fiscal levies which will be imposed in Timor-Leste with respect to the supply of materials, equipment and services or to bear the same,
- 6) To accord Japanese nationals who offer services for the Project for their entry into Timor-Leste and stay therein for the performance of their works,
- 7) To operate and maintain the facilities and equipment provided under the Grant Aid properly and effectively, and to inform the condition of the operation and maintenance of the facilities and equipment as requested by the Japanese side,
- 8) To bear all the expenses other than those to be borne by the Grant Aid, necessary for the implementation and operation and maintenance of the Project.

(2) Obligations to be Undertaken Prior to and during the Implementation of the Project

- 1) To complete land acquisition required for newly construction of the grit chamber at the downstream of the Bemos Intake before commencement of the Project (February 2009).
- 2) To bear the necessary pump operation cost required for water distribution for about 6 months during construction in association with the implementation of improvement work of the Lower Service Reservoir and Valve Chamber in the Bemos Water Treatment Plant.
- 3) To inform beneficiary completely through explanation meeting to local residents, newspapers and/or advertising boards regarding interruption of water supply that will continue for five hours from 10:00AM to 3:00PM and three days a week as the maximum due to the improvement work of the Raw Water Main.
- 4) In order to obtain the permission and royalty exemption for mining river stone material, DNSAS shall make arrangement to clear the following procedures in accordance with the past and on-going projects experiences.

- To obtain the permission from agencies concerned for mining river stone material,
 - To obtain the permission from the Ministry of Infrastructure (MOI) on the aspect of river flow management,
 - To obtain the permission from the National Directorate for Environmental Services, Ministry of Economic & Development with regard to environmental aspect,
 - To obtain the right of quarry works from Forestry and Water Resources Department, Ministry of Agriculture, Forestry and Fisheries, and
 - To explain the project details to the municipalities and communities in and around the project sites, and to obtain their consents.
- 5) The raw water main in the section from Sta.2+094 to Sta. 2+200 (Structure No.10-3) has been exposed by the scouring at the pipe foundation caused by the flood of Bemos river and being hanged on in the air. So, there is a fear of the pipe failure in case of scouring of the exposed part of up and downstream reaches by the next flood. The government of Timor-Leste is requested to implement the protection works (to be referred to the Appendix -9) against pipe failure to the exposed section since there is a flood season before project implementation.
- 6) To make emergency measures and rehabilitate the facilities by the government own budget in case the raw water main would have been damaged by the flood before implementation of Japan's grant aid project.
- 7) To provide the protection fence around the Bemos intake and the grit chamber by the government of Timor-Leste.

2-4 Project Operation Plan

2-4-1 Operation and Maintenance System and Staffing

Production Unit, Dili O&M Division, Dili Water & Sanitation Department is in charge of operation and maintenance work of Bemos raw water main and Bemos water treatment plant. Two contracted caretaker workers living in neighboring village inspect on foot along pipeline to the intake and keep clean the screen everyday. Also other two staffs operate the plant and care for the Lower Service Reservoir. Chief operator is resident in quarters inside the compound.

In the case that facilities are damaged or leakage occurs, if it is a minor nature, the staff belonging to Technical Unit, Dili O&M Division, Dili Water & Sanitation Department repairs it directly. When disaster strikes the facilities or pipe is broken seriously, Dili Water & Sanitation Department requests Planning & Development Department to repair it. Then Planning & Development Department makes survey, design, and cost estimation for tendering and supervises the repair work to be done by a contractor.

**Table 2-4.1 Operation and Maintenance System and Staffing
for Bemos Raw Water Main and Bemos Water Treatment Plant**

Facilities	Bemos Raw Water Main and Intake		The Lower Service Reservoir in Bemos Water Treatment Plant	
Work level	Daily check, Periodical maintenance	Repair work after accident or disaster	Daily operation, Periodical maintenance	Accident response
Higher-level unit for management	DNSAS Dili water & Sanitation Dept. Dili O&M Div.	DNSAS Planning & Development Dep. Survey Planning & Design Supervision Div.	DNSAS Dili water & Sanitation Dept. Dili O&M Div. / Water Quality Analysis Div.	DNSAS Planning & Development Dep. Survey Planning & Design Supervision Div.
Implementation unit for actual works	DNSAS Dili water & Sanitation Dept. Dili O&M Div. Production Unit Intake keeper 2 persons	DNSAS Dili water & Sanitation Dept. Dili O&M Div. Technical Unit	DNSAS Dili water & Sanitation Dept. Dili O&M Div. Production Unit Plant operator 2 persons	DNSAS Dili water & Sanitation Dept. Dili O&M Div. Technical Unit

2-4-2 Contents of Operation and Maintenance Works

DNSAS will be responsible to manage properly the improved facilities with the above O & M system and staffing after the project implementation. Recommended work items are shown on the following tables. The project of human resource developing in waterworks authority in Timor-Leste as a technical cooperation project by Japan is now proceeding with DNSAS. Strengthening of O&M activities in water treatment plant is set up as a result to be accomplished through the project and the expert teams dispatched from JICA will edit the practical O&M manuals and then give technical guidance to DNSAS staff.

Table 2-4.2 Operation and Maintenance Works on Bemos Raw Water Main

Work level	Daily check	Periodical maintenance
Management items of High-level unit	Check of logbook	Check of periodical maintenance record Check of record on parts replacement
Assigned Work for implementation unit	Cleaning of intake screen Cleaning of drain and gutter Weeding of maintenance pass	Scouring of sluiceway and grit chamber Covering on the newly exposed pipe Flush out of sludge drain pipe Check of sluice valve and air valve

**Table 2-4.3 Operation and Maintenance Works
on the Lower Service Reservoir in Bemos Water Treatment Plant**

Work level	Daily check	Periodical maintenance
Management items of High-level unit	Distribution planning Management of flow record Monitoring of water quality control Check of residual chlorine and dosing Management of operation cost	Making Plan of periodical maintenance Historical management of periodical maintenance and repair record
Assigned Work for implementation unit	Outflow valve operation based on distribution plan Surveillance of flow integrator and level meter Recording of flow and keeping logbook Monitoring of chlorination	Leakage check and repair of pipe and valve Operation check and calibration of flow integrator and level meter Drain and cleaning of inside reservoir Touch up paintwork and mortar repair Removal of scale in chlorination pipe Bypass operation

2-5 Project Cost Estimation

2-5-1 Initial Cost Estimation

On the basis of previously described demarcation of works between Japan and Timor-Leste, itemized shares of cost undertaken by Timor-Leste are estimated as follows.

2-5-1-1 Project Cost to be born by Timor-Leste

Item of Cost	Amount	
① Land acquisition for grit chamber	US\$ ****	***million yen
② Temporary pump operation in Bemos water treatment plant	US\$ 5,000	0.53 million yen
③ Land lease and Cutting tree for temporary road	US\$ ***	*** million yen
④ Charge for Banking Arrangement	US\$ 8,000	0.85 million yen
⑤ Fence around intake and grit chamber	US\$ 1,000	0.11 million yen
⑥ Support for raw water main at the exposed section	US\$ 1,500	0.16 million yen
Total	US\$ ***	1.65 million yen

2-5-1-2 Conditions of Estimation

- ① Time of estimation : July, 2008
- ② Exchange rate : 1US\$ = 105.89yen
- ③ Construction period : as shown in the section 2-2-4-7 implementation schedule
- ④ Others : This project is carried out in compliance with the scheme of Japan's Grant Aid.

2-5-2 Operation and Maintenance Cost

The contents of this project are the improvement works for the existing facilities in use and it does not lead a large increase in operation and maintenance cost. Estimated operation and maintenance cost for Bemos raw water main and Bemos water treatment plant is shown in the following table.

**Table 2-5.1 Annual Operation and Maintenance Cost
for Bemos Raw Water Main and Bemos Water Treatment Plant**

Facilities	Item	Annual Cost (US\$)	Basis
Bemos Raw Water Main	Soil covering for the newly exposed pipe	2,900	estimated as filling soil and compaction covering 30cm × width 2m × length 200m / year
	Cleaning and check for intake and valves	2,040	Level-1 staff ⁽¹⁾ 85US\$/month × 2 persons
	Sub total	① 4,940	
Bemos Water Treatment Plant	Power	1,272	106US\$/month (average of Jan-May, 2008)
	Chemicals (sub items)	32,448	2,704US\$/month (average of Jan-May, 2008)
	Coagulant		Aluminum sulfate (powder) injection ratio 20mg/L ⁽²⁾ × flow volume 77,444 m ³ /month ⁽³⁾ × 1.6US\$/kg ⁽⁴⁾ = 2,478US\$/month
	Disinfectant		Calcium hypochlorite (effectiveness 60%) injection ratio 2.5mg/L ⁽²⁾ /0.6 × flow volume 77,444 m ³ /month ⁽³⁾ × 0.7US\$/kg ⁽⁴⁾ = 226US\$/month
	Plant operation	2,220	Level-1 staff ⁽¹⁾ 85US\$/month × 1 person Level-2 staff ⁽¹⁾ 100US\$/month × 1 person
	Sub total	② 35,940	
Repair work and Spare parts		③ 21,248	0.5% of direction construction cost ⁽⁵⁾ 450, million yen × 0.005/105.89US\$/yen
Total		62,128	① + ② + ③
Unit cost for Operation and Maintenance to the distributed water volume from Bemos water treatment plant		0.067US\$/m ³	62,128 US\$/year ÷ (77,444 m ³ /month ⁽³⁾ × 12)

(1): level of public officer in Timor-Leste (2): planned value

(3): Average of distributed water volume from January to May, 2008 recorded by DNSAS

(4): unit price in 2008 (5): Actual finance record of DNSAS from 2005 to 2007 shows that cost for repair work and spare parts in a year is almost five times as much as annual personnel cost. Estimation of repair and spare parts cost for Bemos raw water main and Bemos water treatment plant based on this ratio is nearly equal to the estimation on the above table. (personnel cost(2,040+2,220)US\$/year × 5 = 21,300US\$/year)

2-6 Other Relevant Issues

(1) Category Classification on Environmental Impact

The category of environmental impact by the subject project implementation is classified as C, for which EIA and submission of EMP are not required due to the little impact to the environment. At the time of Basic Design Study, however, it was found out that the validity of the classification will be effective only up to September 2009, and it was necessary to have the validity extended until the end of the effectiveness of the subject Exchange of Notes for the project implementation by two countries. To cope with this, it is confirmed that DNSAS will follow up the matter to have the classification be extended accordingly during the time of explanation mission for the draft Basic Design report. (Ref. Item 5.4 of Minutes of Meeting on Draft B/D report explanation, Appendix-4-2)

(2) Procedures for Securing Permission for Sand and Gravel Collection

For the rehabilitation works for raw water main, it is expected that construction contractor will take sand/gravel material in and around the site for which permissions are required from NDES and the Minister in charge of natural resources. The C category as mentioned above implies the judging by NDES that the subject project will cause a little environmental impact due to the little quantity of sand and gravel materials used for the project and accordingly permitted. However, it is necessary to confirm further that the classification shall be valid and effective until the completion of the subject project implementation. (Ref. Item 5.4 1 of Minutes of Meeting as mentioned above)

In the application for permission from the Minister of natural resources, it is necessary to attach information (outline) on construction works under the project and locations showing material collecting as planned, and these information can be available in the construction plan documents which will be submitted to DNSAS after the construction contract becomes effective. After the contract signing, DNSAS is to obtain the construction plan documents soonest possible and proceed to apply for the permission from the Minister, as agreed upon. (Ref. Item 4-2 of Minutes of Meeting as above.)

(3) Temporary Protection Works for Pipes Exposed and Hanging in the Air

Of the pipeline sections to be rehabilitated, in the No. 10 left bank terrace of Bemos river (hanging in the air), the foundation works for the pipeline has been scoured due to the erosion by river flow. In case if further scouring happened and the air hanging section be extended, the pipe might be broken due to the loads by water and pipe itself. There will be two times of rainy season between the Basic Design and the rehabilitation works under the project, it is deemed necessary to have some temporary works to protect/support the pipeline.

Further, it is noted that DNSAS will make necessary measures and repairs by the Government's own budget in case the raw water main would have been damaged by the floods before implementation of Japan's grant aid project. (Ref. Item 5.3 5 and 5.5 of Minutes of Meeting as above)

Chapter 3 Project Evaluation and Recommendations

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3-1 Project Effects

Through the implementation of the subject grant aid project by means of rehabilitation of intake and raw water main facilities associated with the improvement of the Lower Service Reservoir and valve chamber of Bemos Water Treatment Plant, it is expected that the following effects will be brought about.

Table 3-1.1 Project Effects

Present status and problem areas	Countermeasures under the project	Direct Effects/Improvement	In-direct Effects/Improvement
1) The Bemos raw water main had been severely damaged due to the floods occurred in 2004 and 2005 and DNSAS instantly made necessary repairs to recover the function but the measures taken is not complete in various aspects. 2) There found serious deteriorations in concrete and reinforcing bar materials for the structures for the Lower Service Reservoir and valve chamber of the Bemos Water Treatment Plant, which is judged necessary to have immediate renovation.	1) Bemos raw water main - Rehabilitation of intake and new construction of grit chamber - Reinforcement of river crossing works - Embedding of pipes in the sections with erosion and rock fall, or relocation of pipe route and rehabilitation of retaining wall - Pavement work for the steep slope roads - Installation of isolating valve and wash-out 2) Bemos Water Treatment Plant - Rehabilitation of the Lower Service Reservoir and valve chamber	1) Continuous water supply is assured by the rehabilitation / improvement without the breaking-down of pipeline even in the considerable flood. 2) The daily raw water supply from the Bemos river source will be increased by 13% from 7.8 thousands cubic meter to 8.8 thousands as the obstructing factors for pipe water flow could be removed through installation of air valve and wash-outs. 3) As the system will be provided with easier sand-flushing operation, water supply suspension will be reduced from 7 to 0 days in a year.	1) Through the rehabilitation/improvement, the Bemos raw water main will be able to function quite stably. This will lead the raw water supply for the Dili Water Supply System to be stable and further contributes to improvement of water supply and sanitary conditions of Dili city. 2) With the stabilized raw water supply, it is possible to undertake operation and maintenance of the water supply facilities systematically and this will contribute to building-up of water tariff collection system by DNSAS.

3-2 Recommendations

3-2-1 Matters to be Undertaken by the Government of Timor-Leste

It is noted that the followings are the matters to be undertaken by the Government of Timor-Leste and related recommendations to bring about the project effects positively and in sustainable manner.

(1) Sand Flushing Works for Intake and Raw Water Main

With the implementation of the subject grant aid project, a grit chamber and sand sluiceway will be newly provided at the intake facility. Before the project those accumulated sands had been removed

from the pipeline on a regular basis, but after the project the same will be deposited at the intake, requiring a regular sand flushing works. Also, the number of wash-out attached along the pipeline be increased considerably. It implies that through the facilities improvement as mentioned, the sand flushing works become much easier as compared with the previous situation. It is, therefore, necessary for DNSAS to secure required O & M personnel and budget and undertake O & M activities systematically in a sustainable manner.

(2) Maintenance of Raw Water Main Pipeline in the River Course

Bemos river is a steep slope river and it is expected that such erosion and sedimentation will be repeated every year during the flooding periods even after the subject rehabilitation/improvement works under the project be completed. Therefore, it is deemed necessary for DNSAS to take regular maintenance/repair works such as earth covering for the newly exposed pipes and repairing of gabions damaged due to erosions. This shall include such preventive measures as required in various aspects so as to avoid any large scale accidents/damages which may cause breaking of pipes and water supply suspension.

(3) Operation and Maintenance of Bemos Water Treatment Plant

Concerning the Bemos Water Treatment Plant, the treatment unit which is the core of the plant, has been lately rehabilitated as the grant aid project by the Government of Japan in 2007, and with the implementation of the subject project, raw water supply for the plant will be stably secured as originally planned and further the sustainable use of service reservoir can be secured for a long term basis, operation of the plant to satisfy a systematic water supply plan could be possible. To this end, DNSAS is requested to secure required staff and budget for practicing the reliable/steady plant operation in addition to regular and timely procurement of chemicals, O & M of electro-mechanical facilities and quality control of the treated water and etc.

3-2-2 Collaboration with Technical Cooperation Project and Other Donors

Under the technical cooperation project of “Human resource development in waterworks authority in Timor-Leste” by JICA, which is to be implemented during the period from September 2008 to March 2011, a variety of guidance and training programs are to be provided for the staff/workers in charge of DNSAS. Accordingly, it is expected that practical O & M manual to be prepared by the said project would be fully utilized for the O & M activities by DNSAS staff/workers for the subject raw water main and related facilities.

Further to mention, it is considered necessary and meaningful if the Engineer/expert in charge of the said technical cooperation project by JICA may have regular meetings and exchange ideas/opinions with ADB/Aus AID/other donors for water supply sector concerning such important topics as project implementation methods, problem areas on O & M of water supply facilities and actual examples of effective countermeasures and etc. further to mention, it is expected that in Zone 3 and Zone 4 of the service area will be adopted with hourly water supply restriction during the construction work for Bemos raw water main and the Lower Service Reservoir, and at the same time in zones 2,4 and 5, it is expected also to have pipe laying works for water supply main and distribution

branches under the ADB project. In view of the above, it is quite necessary to have a good coordination among DNSAS, ADB, the above mentioned JICA technical cooperation project and the subject grant aid project concerning the manner how to secure water supply for the people in the relevant zones.

Among others, the subject grant aid project will cause an effect to increase the raw water supply to the Dili water supply system, and it is necessary to materialize the project effect in the form of increased water supply quantity as well as increased supply hours within the service area or in the city area. To cope with this, the following-mentioned associated conditions are to be fulfilled mainly by DNSAS.

- Consolidation of distribution pipe network including main and branches
- Fixing contract for water supply and payment, connecting pipe works and education program for residents
- Making customer registration book and employment of meter-checker

In view of the above requirement, it is considered quite important to have the project effects as derived from ADB supported project be materialized as soon as possible.

Appendices

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5-8 Reference Drawing of Structure No. 10-3: Temporary Pipe Support

Appendix-1 Member List of the Study Team

1-1 Members of the Basic Design Study Team

Name	Job title	Occupation
Mr.Yoshiki OMURA	Team Leader	Senior Advisor, Institute for International Cooperation, JICA
Mr. Hiroshi IKEURA	Project officer (Planning Management)	Program Study Division III, Grant Aid and Loan support Department, JICA
Mr. Tatsuhiko MORI	Chief Engineer (Raw Water Main Planner)	Advisor, Project Operation Division No.2, International Department, Sanyu Consultants Inc.
Mr. Toru TAKAHASHI	Pipeline Engineer	Manager, Project Operation Division No.2, International Department, Sanyu Consultants Inc.
Mr. Seiichi YAMAKAWA	Civil Engineer (River Engineering)	Senior Researcher, Development Department, RDI Co., Ltd.
Mr. Fumihiko KOMADA	Environmental Specialist (Environment and Social Consideration /O&M Planning)	Advisor, Project Operation Division No.2, International Department, Sanyu Consultants Inc.
Mr. Kousuke HIROTA	Cost Estimator (Construction Planning and Cost Estimation)	Senior Engineer, Project Operation Division No.2, International Department, Sanyu Consultants Inc.

1-2 Members of the Additional Study Team

Name	Job title	Occupation
Mr. Toru TAKAHASHI	Distribution Facilities Planning	Manager, Project Operation Division No.2, International Department, Sanyu Consultants INC.
Mr. Tsutomu SENDA	Civil Structure Design	Adviser, Project Operation Division No.2, International Department, Sanyu Consultants INC.

1-3 Members of the Study Team for Explanation of the Draft Basic Design

Name	Job title	Occupation
Mr.Hiroshi ENOMOTO	Team Leader	Resident Representative, JICA Timor-Leste Office
Mr. Hiroshi IKEURA	Project officer (Planning Management)	Program Study Division III, Grant Aid and Loan support Department, JICA
Mr. Fumihiko KOMADA	Acting Chief Engineer	Advisor, Project Operation Division No.2, International Department, Sanyu Consultants Inc.
Mr. Toru TAKAHASHI	Pipeline Engineer	Manager, Project Operation Division No.2, International Department, Sanyu Consultants Inc.

Appendix-2 Study Schedule

2-1 Basic Design Study

Basic Design Study			Consultant Members						
No.	Date	Day	Official Members	Chief Engineer (Raw Water Main Planning)	Pipeline Engineer	Civil Engineer (River Engineering)	Environment Specialist (Environmental and Social Consideration)	Cost Estimator (Construction Planning and Cost Estimation)	
1	Jun.5	Thu		Trip (Nagoya-Denpasar)	Trip (Tokyo-Denpasar)		Trip (Nagoya-Denpasar)		
2	Jun.6	Fri		Trip (Denpasar-Dili)					
3	Jun.7	Sat		Courtesy call to MOI, EOJ, JICA					
4	Jun.8	Sun		Site survey					
5	Jun.9	Mon		Arranging of collected materials					
6	Jun.10	Tue		Meeting with DNSAS Explanation on Ic/R and Questionnaire		Arrangement of topographic survey	Arrangement of baseline survey		
7	Jun.11	Wed		Survey on the past project and other Donors		Collecting the design data of existing structure			
8	Jun.12	Thu		Survey on the implementation system of DNSAS		Survey on the other similar projects	Survey on repair history		Survey on organization for O&M
9	Jun.13	Fri		ditto		Site survey (Route survey of raw water main)			Baseline survey
10	Jun.14	Sat		Survey on water demand in Dili		Route survey of raw main	Survey on flood level		ditto
11	Jun.15	Sun		ditto		Survey at intake	ditto		ditto
12	Jun.16	Mon		Arranging of collected materials					Trip (Tokyo-Denpasar)
13	Jun.17	Tue	Trip (Tokyo-Denpasar)	Survey on water resources in Dili	Survey on facility and equipment	ditto	Survey on environmental and social conditions	Survey on cost estimation	
14	Jun.18	Wed	Trip (Denpasar-Dili) Meeting at JICA East Timor office Courtesy call to EOJ Internal meeting of study team	Meeting at JICA East Timor office Courtesy call to EOJ Internal meeting of study team		Survey on rock falling	ditto	ditto	
15	Jun.19	Thu	Courtesy call to NDPEA-MOF,NDES-MED, MOI Discussion with DNSAS about M/D			ditto	ditto	ditto	
16	Jun.20	Fri	Site survey Discussion with DNSAS about M/D			ditto	Survey on O&M works	ditto	
17	Jun.21	Sat	Site survey / Internal meeting						
18	Jun.22	Sun	Internal meeting						
19	Jun.23	Mon	Courtesy call to ADB Discussion with DNSAS about M/D			Survey on rock falling	Survey on O&M works	Site survey	
20	Jun.24	Tue	Signing on M/D Report to EOJ, JICA			Survey on bank protection	ditto	ditto	
21	Jun.25	Wed	Trip (Dili-Denpasar)	Survey on water resources in Dili	Survey on facility and equipment	ditto	ditto	Survey on procurement conditions	
22	Jun.26	Thu	Trip (Denpasar-Tokyo)	Consideration of validity and scope of Grant Aid		Survey on rock falling	ditto	ditto	
23	Jun.27	Fri		ditto	ditto	Survey on rock falling	ditto	Survey on construction plan	
24	Jun.28	Sat		Survey on the items borne by East Timor	ditto	Survey on rock falling	ditto	ditto	
25	Jun.29	Sun		Arranging of collected materials					
26	Jun.30	Mon		Survey on the items borne by East Timor	Collecting the design criteria, water act	Survey on bank protection	Survey on collecting water Tariff	Collecting quotations	
27	Jul.1	Tue		Survey on the effect of Grant Aid	ditto	ditto	ditto	ditto	
28	Jul.2	Wed		Preparation of a report of the survey result in Dili					
29	Jul.3	Thu		Report to MOI, DNSAS, EOJ, JICA					
30	Jul.4	Fri		Trip (Dili-Denpasar)					
31	Jul.5	Sat		Trip (Denpasar-Nagoya)	Trip (Denpasar-Tokyo)		Trip (Denpasar-Nagoya)	Trip (Denpasar-Tokyo)	

MOI: Ministry of Infrastructure
MED: Ministry of Economic and Development
MOF: Ministry of Finance
EOJ: Embassy of Japan

DNSAS: National Directorate of Water and Sanitation on Service
NDES: National Directorate for Environment Service
NDPEA: National Directorate for Planning and External Assistance
JICA: Japan International Cooperation Agency

2-2 Additional Field Survey (Lower Service Reservoir & Valve Chamber)

	No. Date	Day	Consultant Members	
			Distribution Facilities Planning	Civil Structure Design
1	Oct.14	Tue	Trip: Tokyo - Denpasar	
2	Oct.15	Wed	Trip: Denpasar - Dili 15:00 Visit to JICA office (JICA Okumura) 16:00 Meeting with DNSAS (JICA Okumura joins)	
3	Oct.16	Thu	Survey on the use of service reservoir at Bemos treatment plant, Arrangement of topographic survey and safety equipment	
4	Oct.17	Fri	Collecting the previous material on design and construction, Survey on leakage and seepage from service reservoir	Visual check in valve chamber of the lower service reservoir at Bemos treatment plant
5	Oct.18	Sat	Survey on the existing pipe arrangement, instrumentation cables, Survey on landform of Bemos treatment plant	Survey on deflection and deformation of service reservoir and valve chamber at Bemos treatment plant
6	Oct.19	Sun	Joint confirmation of topographic survey at Bemos treatment plant, Arranging the result of survey in the	
7	Oct.20	Mon	Strength test with Schmidt hammer at valve chamber of Bemos treatment plant	
8	Oct.21	Tue	Visual check inside the lower service reservoir of Bemos treatment plant, Check the clack and exposed re-bar depending on the availability	
9	Oct.22	Wed	Water level observation at the lower service reservoir at Bemos treatment plant, Visual check inside the upper service reservoir depending on the availability	
10	Oct.23	Thu	Site check of the topographic survey result and instruction of the necessary additional work	Visual check of outside the upper service reservoir of Bemos treatment plant
11	Oct.24	Fri	Evaluation of the existing facilities 14:30 Discussion on the coping strategy with DNSAS 16:00 Report to EOJ (JICA Okumura joins)	
12	Oct.25	Sat	Arranging data and collected materials, Arranging the consultation result	
13	Oct.26	Sun	Confirmation of the final topographic survey result, Supplement survey on raw water main	
14	Oct.27	Mon	9:00 Report to DNSAS and JICA office (JICA Okumura joins) Trip: Dili - Denpasar	
15	Oct.28	Tue	Trip: Denpasar - Tokyo	

2-3. Explanation of the Draft Basic Design Study Report

2.3. Explanation of the Draft Basic Design Study Report

No.	Date		Official Members		Consultant Members	
			Team Leader	Project Officer	Chief Engineer (Substitute)	Pipeline Design Engineer
1	Jan.25	Sun		Trip (Narita-Denpasar)		
2	Jan.26	Mon	Meeting with JICA Timor Office	Trip (Denpasar-Dili) Meeting with JICA Timor Office		
3	Jan.27	Tue	Courtesy call to Ministry of Infastructure, Courtesy call to Ministry of Finance, Meeting with DNSAS CD Project, Explanation about Draft report at DNSAS			
4	Jan.28	Wed	Field survey: Bemos Raw Water Main, Discussion with DNSAS			
5	Jan.29	Thu	Final discussion with DNSAS, Signing of Miniutes of Discussion by Team Leader and Minister, Report to JICA Timor Office			
6	Jan.30	Fri	Report to Embassy of Japan (EOJ)	Report to EOJ Trip (Dili - Denpasar)	Report to EOJ, Field survey (Bemos WTP Lower Service Reservoir & Valve Chamber)	
7	Jan.31	Sat		Trip (Denpasar - Narita)	Field Survey (Data collection for Cost Estimation)	
8	Feb.1	Sun			Trip (Dili - Denpasar)	
9	Feb.2	Mon			Trip (Denpasar - Nagoya)	Trip (Denpasar - Narita)

Appendix - 3 List of Parties Concerned in Timor-Leste

No.	Name	Position
Ministry of Infrastructure		
1.	Mr. Pedro Lay Da Silva	Minister
2.	Mr. Domingos Dos Santos Caeiro	Secretary of State, Public Works
3.	Mr. Arq. Januario da Costa Pereira	Secretary of State on Electricity, Water and Urbanization
National Directorate of Water and Sanitation Services (DNSAS), Ministry of Infrastructure		
1.	Mr. Joao Pereira Jeronimo	Director
2.	Mr. Rui De Sousa	Chief, Planning and Development Division
3.	Mr. Mario Abel Sequeira	Planning and Development Division
4.	Mr. Celso A. S. Pereira	Dili Water Supply Department
5.	Mr. Fransisco X. Pereira	Dili Operation and Management Division
6.	Mr. Elias Pereira Moniz	Chief, Water supply and Sanitation Department
7.	Mr. Pascoal Ribeiro	Production Section
8.	Mr. Jaime Freitas Da C-Feraira	Production Section
9.	Mr. Benny	Bemos Water treatment plant
National Directorate for Planning and External Assistance Coordination, Ministry of Finance		
1.	Mr. Eusebio Da Cost Jeronimo	Director
2.	Mr. Helder da Costa	Coordinatr Aid effectiveness &National Priorities Secretariat
3.	Mr. Hiroaki Yamanishi	Aid Coordination Advisor
National Directorate for Environmental Servises (DNES), Ministry of Economy and Development		
1.	Mr. Carlos Lopes Ximenes	Director
2.	Mr. Antnio Lelo Taci	Coordinator, Department of Environmental Impact Assessment
3.	Mr. Carlos Conseicao	Environmental Pollution Control coordinator
National Directorate of Land and Property and Cadastral Services, Ministry of Justice		
1.	Mr. Paulino Da Cruz	Head of Cadastral and Land Information
Embassy of Japan		
1.	Mr. Kenji Shimizu	Ambassador (at the time of Basic Design Study)
2.	Mr. Iwao Kitahara	Ambassador (at the time of Explanation of Draft Basic Design)
3.	Mr. Shinobu Yamaguchi	First Secretary
4.	Ms. Yasuko Hayashi	Second Secretrary
JICA Timor-Leste Office		
1.	Mr. Tetsuya Kamijo	Resident Representative (at the time of Basic Design Study)
2.	Mr. Hiroshi Enomoto	Resident Representative (at the time of Explanation of Draft Basic Design)
3.	Mr. Yasukazu Wada	Assistant Resident Representative (at the time of Basic Design Study)
4.	Mr. Masami Okumura	Assistant Resident Representative (at the time of Explanation of Draft Basic Design)
Technical Coperation Project		
1.	Mr. Judo Hagiwara	Expert
2.	Mr. Takayuki Tange	Expert
3.	Mr. Hideaki Tono	Expert
Asian Depelopment Bank, Special Office in Timor-Leste		
1.	Mr. Brigido de Sousa	Finance and Administrative Officer
Oxfam (NGO)		
1.	Mr. Jesse Shapiro	Advisor in DINSAS for water supply to IDP camp

Appendix-4 Minutes of Discussions

Appendix 4-1 At Basic Design Study (June 24, 2008)A4-2

Appendix 4-2 At Explanation on Draft B/D Report (January 29, 2009)A4-7

4-1 At Basic Design Study

MINUTES OF DISCUSSIONS
ON THE BASIC DESIGN STUDY
OF THE PROJECT FOR URGENT IMPROVEMENT OF RAW WATER MAIN IN DILI
THE DEMOCRATIC REPUBLIC OF TIMOR-LESTE

In response to a request from the Government of the Democratic Republic of Timor-Leste (hereinafter referred to as "Timor-Leste"), the Government of Japan decided to conduct a Basic Design Study of the Project for Urgent Improvement of Raw Water Main in Dili, in Timor-Leste (hereinafter referred to as "the Project") and entrusted the Study to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to Timor-Leste the Basic Design Study Team (hereinafter referred to as "the Team"), which is headed by Mr. Yoshiki OMURA, Senior Advisor, JICA, and is scheduled to stay in the country from 6th June 2008 to 4th July 2008.

The Team held a series of discussions with the officials concerned of the Government of Timor-Leste and conducted a field survey in the Project area.

In the course of discussions and field survey, both parties have confirmed the main items described in the attached sheets. The Team will proceed to further works and prepare the Basic Design Study Report.

Dili, 24th June 2008




Mr. Yoshiki OMURA
Leader
Basic Design Study Team
Japan International Cooperation Agency



Mr. Pedro Lay da Silva
Minister
Ministry of Infrastructure
Democratic Republic of Timor-Leste

Witnessed by



Ms. Emilia Pires
Minister
Ministry of Finance
Democratic Republic of Timor-Leste

ATTACHMENT

1. Objective of the Project

The objective of the Project is to secure safe and stable water supply in Dili by improvement of the raw water main from the Bemós River.

2. Project site (s)

The site of the Project is as shown in Annex-1.

3. Responsible and Implementing Organization

The Responsible and Implementing Organization is the National Directorate of Water and Sanitation Services under the Ministry of Infrastructure (hereinafter referred to as "DNSAS").

4. Items requested by the Government of Timor-Leste

After discussions with the Team, the items described in Annex-2 were finally requested by the Government of Timor-Leste. JICA will assess the appropriateness of the request and will recommend to the Government of Japan for approval.

5. Japan's Grant Aid Scheme

The Government of Timor-Leste understood the Japan's Grant Aid Scheme and the necessary measures to be taken by the Government of Timor-Leste as explained by the Team and described in Annex-3 and Annex-4 of the Minutes of Discussions signed by both parties on 22nd January 2008.

6. Schedule of the Study

6-1. Consultant members will proceed to further studies in Timor-Leste until 4th July 2008.

6-2. JICA will prepare the draft report in English and dispatch a mission in order to explain its contents in September 2008.

6-3. In case that the contents of the report is accepted in principle by the Government of Timor-Leste, JICA will finalize the report and send it to the Government of Timor-Leste by December 2008.

7. Other relevant issues

7-1. Concept of the Project

The Team explained to DNSAS about the concept of the Project as below (1) and (2).

- (1) The existing raw water transmission system of the Bemós River should be utilized with proper improvement as much as practicable. Re-routing of pipeline should be limited to



minimum extent.

- (2) The improvement of pipeline shall be designed to enable DNSAS to maintain and repair easily, considering the natural conditions, constrain of supply and procurement of material /equipment and skills of workers.

DNSAS accepted the concepts.

7-2. Water intake facilities

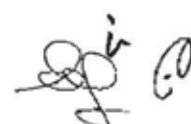
The Team explained DNSAS of a plan to construct a grit chamber approximately 100m downstream of the intake. In this regard, the Team requested and DNSAS agreed to negotiate with the landowner of the proposed location of grit chamber for transferring the land ownership to DNSAS and to submit JICA an evidence of land acquisition by the middle of October 2008.

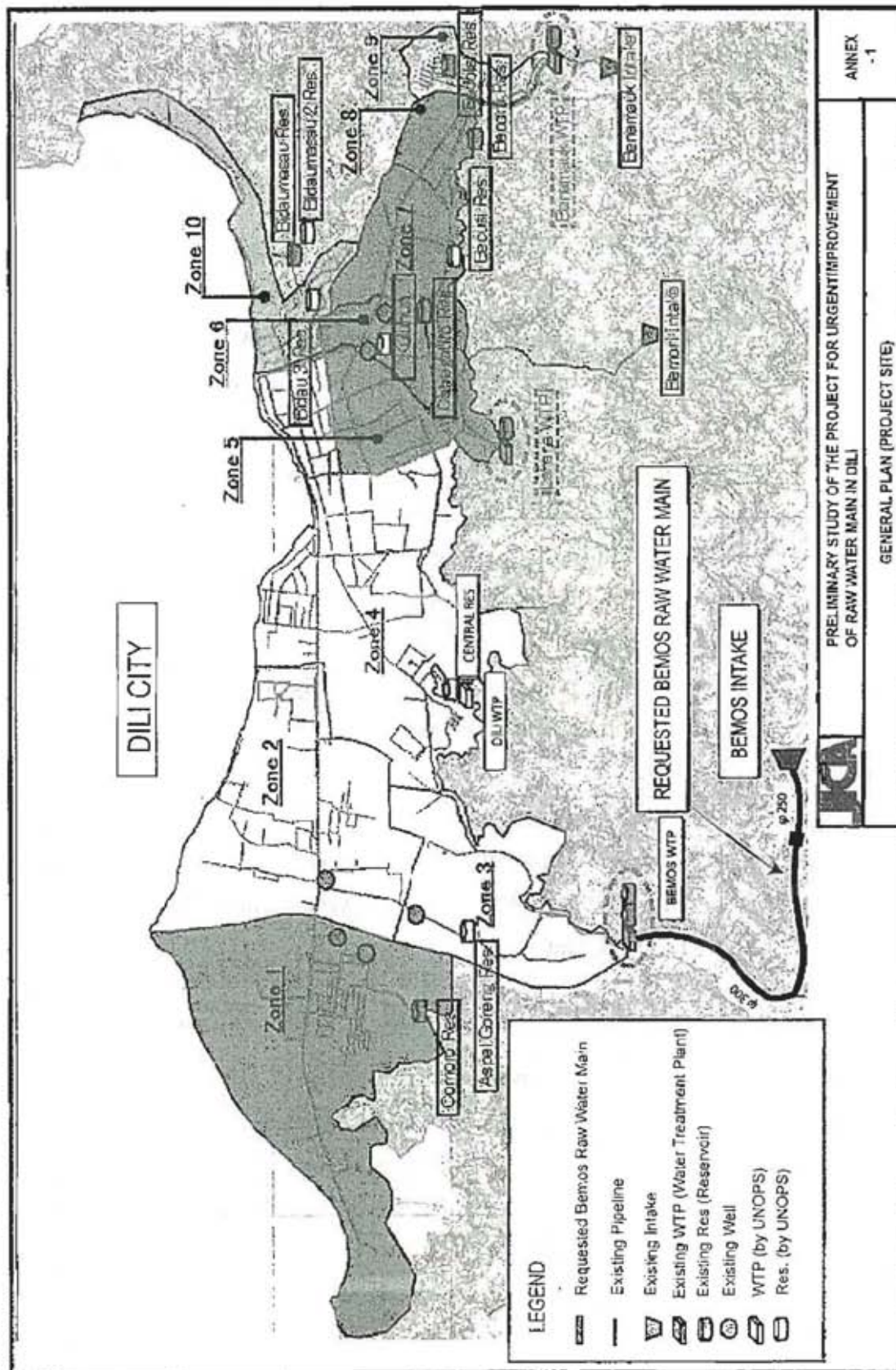
7-3. Environmental and social considerations

The Team explained DNSAS that DNSAS has to have the Environmental Management Plan (hereinafter referred to as "EMP") approved by the National Directorate of Environmental Service, Ministry of Economic and Development by the end of October 2008. The Team proposed to support DNSAS in preparing EMP and to provide the necessary information in the beginning of September. DNSAS assured to secure the above mentioned approval.

Annex-1 Project Site

Annex-2 Items requested by the Government of Timor-Leste





Items Requested by the Government of Timor-Leste

I. Rehabilitation and Improvement of Bemos Raw Water Main

- Replacement of parts of the 250mm and 300mm diameter steel pipe to avoid and minimize possible damage thereto by the torrential runoff after heavy rain,
- Repair of pipe supports and bank protection damaged by the flood,
- Construction of additional concrete supports, protection walls, groyne, concrete blocks, foot protection and other measures to protect the raw water main, as required,
- Reinforcement of the pipe protection particularly at the river crossings, and construction of a pipe bridge(s) when considered cost-effective and appropriate,
- Installation of additional air valves and wash-outs including isolation valves with necessary appurtenances as required,
- Installation of a flow controller on the raw water main to regulate water flow, when required, and
- Other necessary work, as required.

II. Rehabilitation and improvement of the intake

- Rehabilitation of weir to recover erosion and increase stability, and
- Rehabilitation of the intake chamber by providing screens and any other devices to minimize entrance of foreign matters like gravels, sand, silt, and leaves into the chamber.

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4-2 At Explanation on Draft B/D Report

MINUTES OF DISCUSSIONS
ON
THE BASIC DESIGN STUDY
OF
THE PROJECT FOR URGENT IMPROVEMENT OF RAW WATER MAIN IN DILI
THE DEMOCRATIC REPUBLIC OF TIMOR-LESTE
(EXPLANATION on DRAFT report)

In June 2008, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched a Basic Design Study Team on the Project for Urgent Improvement of Raw Water Main in Dili (hereinafter referred to as "the Project") to the Government of the Democratic Republic of Timor-Leste (hereinafter referred to as "Timor-Leste") and through discussion, field survey and technical evaluation of the results in Japan, JICA prepared a draft report of the study.


In order to explain and consult with the Government of Timor-Leste on the components of the draft report, JICA sent to Timor-Leste the Draft Report Explanation Team (hereinafter referred to as "the Team"), which was headed by Mr. Hiroshi Enomoto, Chief Representative, JICA Timor-Leste Office, from 26th to 30th January 2009.

As a result of discussions, both parties confirmed the main items described in the attached sheets.


Dili, 29th January 2009

榎本 宏

Mr. Hiroshi Enomoto
Leader
Draft Report Explanation Team
Japan International Cooperation Agency
Japan


Arch. Januario da Costa Pereira
Secretary of State
for Electricity, Water and Urbanization
Ministry of Infrastructure
The Democratic Republic of Timor-Leste

Witnessed by


Ms. Emilia Pires
Minister
Ministry of Finance
The Democratic Republic of Timor-Leste

ATTACHMENT

1 Components of the Draft Report

The Timor-Leste side agreed and accepted in principle the components of the Draft Basic Design Study Report explained by the Team. The Timor-Leste side also understood that JICA would commence procedures for project implementation subject to submission of an official request for additional components of reconstruction of the Lower Service Reservoir and the Valve Chamber, which were not included in the original request of January 2006. The project components are shown in Annex-1 and 2.

2 Japan's Grant Aid Scheme

The Timor-Leste side understood the Japan's Grant Aid Scheme and the necessary measures to be taken by the Timor-Leste side as explained by the Team and described in Annex-3 and Annex-4 of the Minutes of Discussions signed by both parties on 22nd January 2008.

3 Responsible and Implementing Agency

The Responsible and Implementing Organization is the National Directorate of Water and Sanitation Services (hereinafter referred to as "DNSAS") under the Ministry of Infrastructure (hereinafter referred to as "MOI").

4 Schedule of the Study

JICA will complete the final report in accordance with the confirmed item and send it to the Government of Timor-Leste by April 2009.

5 Other Relevant Issues

5.1 Submission of an Additional Request

The Team explained and the Timor-Leste side understood that JICA would be able to commence project implementation procedures only after submission of an additional request from the responsible agency for reconstruction of the Lower Service Reservoir and the Valve Chamber by 15 February 2009.

5.2 Title of the Project

In response to an additional component of reconstruction of the Lower Service Reservoir and the Valve Chamber in Bemos Water Treatment Plant, the Team proposed that the title of



the Project be changed as "the Project for Urgent Improvement of Water Supply System in Bemos-Dili". The Timor-Leste side accepted the new project title.

5.3 Undertakings of the Timor-Leste side

The Team requested the Government of Timor-Leste to abide by the following undertakings of the Timor-Leste side in addition to major understandings described in Annex-4 of the Minutes of Discussions signed by both parties on 22nd January 2008. The Timor-Leste side agreed to do so.

- 1) To complete land acquisition required for construction of the Grit Chamber at the downstream of the Bemos Intake by the end of February 2009 and to submit evidence to JICA Timor-Leste office.
- 2) To bear the necessary pump operation cost required for transfer of filtered water to the Upper Service Reservoir for about 6 months during reconstruction work of the Lower Service Reservoir and Valve Chamber in the Bemos Water Treatment Plant.
- 3) To keep water users informed of scheduled interruptions of water supply due to the improvement work of the Raw Water Main through meetings, newspapers and advertising boards.
- 4) To explain the project details to the municipalities and communities in and around the project sites, and to obtain their consents.
- 5) To make emergency measures and rehabilitate the facilities by the government own budget in case the raw water main would have been damaged before implementation of Japan's grant aid project.
- 6) To provide the fence around the Bemos intake and the Grit Chamber by the government of Timor-Leste.
- 7) To operate and maintain the facilities to be improved by the Project sustainably.

5.4 Permissions for Excavation of River Stone/Sand

The Team requested the Timor-Leste side to make arrangement to obtain the documents for permission concerning excavation of river stone/sand necessary for the project by a Japanese contractor without paying fee, tax or royalty. The Timor-Leste side explained following two permissions are necessary.

- 1) Permission with regard to environmental aspect from the National Directorate for Environmental Services (hereinafter referred to as "NDES"), Ministry of Economic and Development.
- 2) Permission with regard to excavation of stone/sand from Secretary of State for Natural Resources.

The Timor-Leste side also explained to the Team that the Timor-Leste side already submitted an application of categorization on this project to NDES and obtained the permission by 08 July 2009 which was including excavation of river stone/sand. Moreover the Timor-Leste side explained that the period of permission will be extended to March 2011. The Team requested and the Timor-Leste side agreed to submit evidence of extension of period to the JICA Timor-Leste office by the end of February 2009.

Regarding excavation of stone/soil, detail information and plan of construction to be submitted from the constructor are necessary as attachment of application. The Team requested and the Timor-Leste side agreed that the Timor-Leste side will apply for Secretary of State for Natural Resources after the contract with constructor immediately.

5.5 Temporary Protection

In considering commencement timing of construction work, the Team recommended the Timor-Leste side to provide temporary protection to the pipeline, the exposed and the hanged sections, in particular, and to take immediate actions to rehabilitate any damages occurred to the pipeline until commencement of the project.

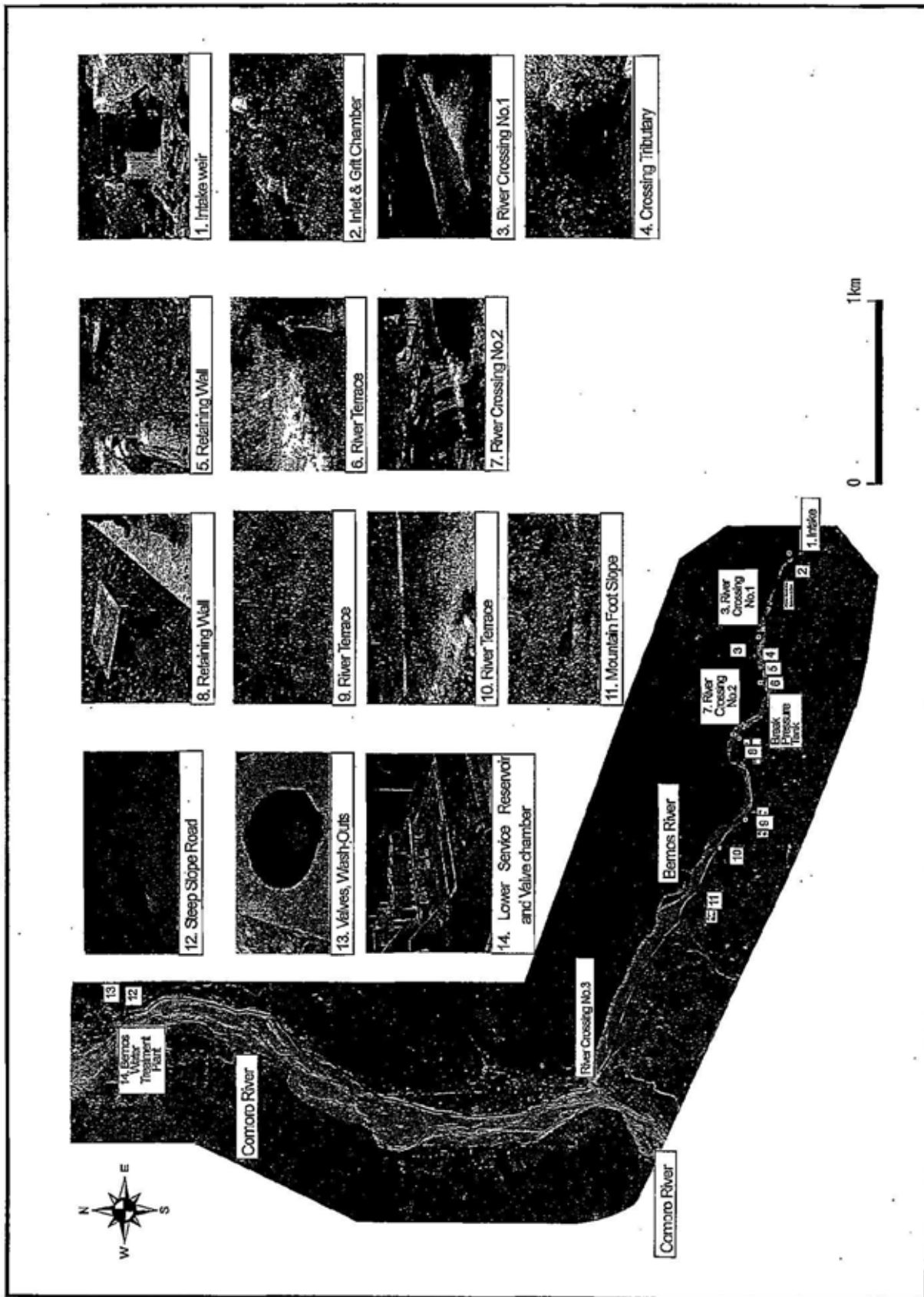
5.6 Project Cost Estimate

The Team explained to the Timor-Leste side the Project cost estimate as described in Annex-3. Both sides confirmed that this cost estimate was provisional and would be examined further by the Government of Japan for its approval as the Grant.

Furthermore, both sides confirmed that this cost estimate should never be duplicated in any form nor released to any other party(s) until relevant contracts are awarded by executing agency. This embargo is for securing fairness of tender procedure.

Project Components

Work items		Length	Rehabilitation / Improvement manner
1	Intake weir	-	<ul style="list-style-type: none"> • Construction of sand sluiceway • Improvement of apron and river bed protection • Repair of crest and abutment
2	Inlet and Grit chamber	17 m	<ul style="list-style-type: none"> • Improvement of inlet • A part of pipeline be changed to connecting canal • Construction of grit chamber • Construction of Sand Sluice canal
3	0+495 ~ 0+545 River crossing No.1	50 m	<ul style="list-style-type: none"> • Concrete reinforcement on existing pipeline protection • Construction of ground sill and river bed protection at lower stream reach • Scouring Protection Revetment on both banks • Construction of wash-out
4	0+584 ~ 0+742 Right bank river terrace, crossing with tributary and existing wing of retaining wall	200 m	<ul style="list-style-type: none"> • Change of pipeline route and tributary crossing by aqueduct • Construction of Flow Path at the tributary crossing • Construction of Wash-out
5	0+787 ~ 0+876 Existing upstream concrete retaining wall	80 m	<ul style="list-style-type: none"> • In between the retaining wall and upright rise around the pipe be re-filled with sand and gravel and covered by gabion • Retaining wall heightening (partially) • A part of pipeline be shifted
6	0+876 ~ 0+947 Right bank river terrace	100 m	<ul style="list-style-type: none"> • Revetment on river terrace
7	1+142 ~ 1+220 River crossing No.2	80 m	<ul style="list-style-type: none"> • Concrete reinforcement on concrete river bed protection • Construction of ground sill and river bed protection at lower stream reach • Scouring protection revetment on both banks • Construction of wash-out
8	IP34 / IP36 (1+420 ~ 1+530) Existing downstream concrete retaining wall	59 m	<ul style="list-style-type: none"> • In between the retaining wall and upright rise around the pipe be re-filled with sand and gravel • Heightening of retaining wall (partially) • Foot protection works for foundation of retaining wall
9	IP42 (1+938) Left bank terrace of Bemros river	50 m	<ul style="list-style-type: none"> • Protection of existing pipeline by revetment and re-filling by sand and gravel
10	2+094 ~ 2+200 Left bank terrace of Bemros river (Pipeline hanging in the air)	100 m	<ul style="list-style-type: none"> • Route change and embedding the pipe in river bed • Encasement by concrete • River bed protection
11	2+365 ~ 2+570 Mountain foot slope of left bank of Bemros river	179 m	<ul style="list-style-type: none"> • (Pipeline exposed section as per design, but many rock fall and strike the pipeline, so that) • Shifting of pipeline route and embedding
12	7+000 ~ 7+053 Comoro river right bank Steep slope road section	70 m	<ul style="list-style-type: none"> • Construction of dual purpose road and drain (concrete pavement with wheel guard) • Construction of road side protection works including pipe supports
13	Isolating valve, wash-outs	-	<ul style="list-style-type: none"> • Allocate as required for easier O&M
14	Bemros Water Treatment Plant lower service reservoir & valve chamber	-	<ul style="list-style-type: none"> • Renovate the facilities to have the same capacity and function with the existing ones



Location Map of the Facilities to be Improved

Project Cost Estimation

2. Obligation of the Government of Timor-Leste

(1) Project cost

Item of Cost	Amount (US\$)
Land acquisition for grit chamber	-
Temporary pump operation in Bemos Water Treatment Plant	5,000
Land lease and Cutting tree for temporary road	-
Fence around intake and Grit Chamber	1,000
Support for Raw Water Main at the exposed section	1,500
Charge for Banking Arrangement	8,000
Total	15,500

(2) Operation and Maintenance (O&M) Cost

Description		Amount (US\$/year)
Bemos Raw Water Main	Soil covering for the newly exposed pipe	2,900
	Cleaning and check for intake and valves	2,040
	Sub total	4,940
Bemos Water Treatment Plant	Power	1,272
	Chemicals	32,448
	Plant operation	2,220
	Sub total	35,940
Repair work and Spare parts		21,248
Total		62,128