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資料 1 T / R、S / W、M / M

1.1 T / R

REVISED TECHNICAL ASSISTANCE PROJECT PROFORMA  
(REVISED TAPP)

AS RECOMMENDED BY SPEC MEETING HELD ON 23-7-97

FOR

FEASIBILITY STUDY ON  
EXTENSION & EXPANSION OF  
MOHARA WATER TREATMENT PLANT

JULY 1997

CHITTAGONG WATER & SEWERAGE AUTHORITY  
WASA OFFICE BUILDING  
DAMPARA, CHITTAGONG.  
BANGLADESH.

**TAPP PART-A : PROJECT IDENTIFICATION****PROJECT NO. (1)****TAPP DATE (2)****REVISED (3)****PROJECT TITLE (4)**

Fesibility Study on Extension &amp; Expansion of Mohara Water Treatment Plant

Adminstrative Ministry (5)

Ministry of LGRD & Co-operatives,  
Local Govt. Division.

Executing Agency (6)

Chittagong Water Supply &amp; Sewerage Authority.

**SECTOR (7)**Physical Planning, Water Supply  
and Housing.**PROJECT MANAGER (8)**

None

TAPP PREPARED BY (9)

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WASA, Chittagong.

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**TAPP PART-B PROJECT DATES.**

PLANNED	DD	MM	YY(10)	PLANNED	DD	MM	YY(11)
Start	1	12	97	Completion	30	11	98

**TAPP PART-C. PROJECT FINANCING.****DONAR (12)**

LOCAL COST SOURCE (13)

**GOVT. OF JAPAN (Proposed)**

FOREIGN SOURCE (14)

CURRENCY/RATE (15)

Grant Aid Assistance from  
Govt. of Japan  
US\$ 1 = Tk. 40.

PROJECT COST	TOTAL COST TK. LAC	F.EX. COST TK. LAC	TAKA COST IN LAC	GOB COST TK. LAC	PROJECT AID TK. LAC	RPA TK. LAC	CDVAT TK. LAC
	(16)	(17)	(18)	(19)	(20)	(21)	(22)
FY/1	167.43	37.43	-	30.00	137.43	-	5.00
FY/2	166.05	139.05	-	27.00	139.05	-	-
TOTAL	333.48	276.48	-	57.00	276.48	-	5.00

FINANCIAL ARRANGEMENT WITH DONAR(23)	NONE	DISCUSSED
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**NAME AND DESIGNATION OF DONAR CONTRACTED (24)**

FINANCING AFTER COMPLETION OF THE PROJECT	FUND REQUIRED YEARS 1/2/3
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**MODE OF FINANCING (25)**

DONAR Govt. of Japan (Proposed)	LOAN/GRANT	GOB ADP BUDGET	REVENUE BUDGET
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**SELF FINANCING %(27)**

X
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## **TAPP PART-D-1**

### **PROJECT DESCRIPTION (28)**

Chittagong is the major seaport of Bangladesh, lying in the south-eastern part of the country. The city is situated on a peninsula bounded on the west by the Bay of Bengal and on the east by the Karnaphuli river. The city proper extends in an easternly direction from the old city. New residential and industrial development areas stretch forth in all directions. The major portion of populated area is situated on a peninsular plateau surrounded by low-lying areas. Construction of the new bridge over the Karnaphuli river provides new development opportunities for the city on the left bank.

With a view to prepare the investment project, feasibility study was carried out during 1989 with the Technical Assistance Fund (Netherland Trust Fund) administered by World Bank. During the formulation of investment Project it becomes apparent that the present data base for most of the Works is insufficient to prepare detail recommendation for the investment project to be executed or to be prepared Final Design. As the Final Engineering Design and contract documents, topographical surveys are to be made for preparation of each of the sub-projects, to be implemented under this investment project a further feasibility study is must on the part of the Donor. This project is preparatory technical Assistance with the objective to prepare or formulate an investment project for the improvement and extension of Water Supply System in Chittagong. Further details are presented in the comprehensive Terms of Reference.

Chittagong WASA was established in 1963 and took over the public water supply system from the then Chittagong Municipality, Public Health Engineering Department and Housing and Settlement Directorate. Since Creation, Chittagong WASA implemented its 1st & 2nd Chittagong Water Supply project and achieved the capacity of producing 40 MGD water per day. But at present Chittagong WASA is able to produce only 30MG water per day. According to present population, the demand of water is about 60.00 Million Gallons per day. For meeting this demand the proposed Extension and Expansion of Mohara Water Treatment plant with all ancillary works, on the Halda River, Which is a source of surface water is required to be implemented soon. Therefore, the proposed Feasibility study for the same is very much essential for preparation of investment project.

### **ENVIRONMENTAL IMPACT ASSESSMENT STUDY**

In accordance with the Government procedure the environmental Impact Assessment Study (a sub-project) is a must before taking up any investment project. Accordingly, the Environmental Assessment study has been included in this proposed project as one of the component of the project. The determination of beneficial and adverse effects of the project activities and recommendation for minimizing of adverse effects are within the scope of this environmental assessment study.

## **TAPP PART-D-2**

### **OBJECTIVES OF THE STUDY (29)**

The objectives of the Study are :

1. to formulate a basic plan for improvement of Extension and Expansion of Mohara Water Treatment Plant (here in after referred to as "MTP") and trunk, distribution manias, for the target year 2010.
2. to conduct a feasibility study on the priority project(s) selected from the basic plan, and
3. to transfer technology on planning methods and skills to counterpart personnel in the course of the Study.

### **CONSEQUENCES IF NOT APPROVED (30)**

The improvement of water supply facilities in Chittagong must follow on from existing service levels and realistic review of perceived Future needs. This is a fundamental necessity for properly development, if this project is not approved, the proposed investment project can not be prepared, the water supply situation in Chittagong will deteriorate rapidly due to population growth and increase of industrial and Commercial units day by day.

### **LINKAGE TO OTHER PROJECT / ORGANIZATION (31)**

The findings of this study will be incorporated for preparation of the details design drawings for a complete water supply system. Chittagong WASA has implemented two more similar type of projects. Therefore, project has a direct linkage with those and also with the scope of services of this organization.

## **TAPP PART-E**

### **PROJECT OUTPUT IN QUANTITATIVE OR QUALITATIVE TERMS (32)**

**PREPARATORY ASSISTANCE** : This preparatory technical assistance will enable formulation of water supply project to be implemented.

**TECHNOLOGY TRANSFER** : Since the feasibility study will be carried out by the expatriate & CWASA personnel (Mohara Treatment Plant set-up), therefore, there will be scope of transferring foreign modern technology from expatriate consultants to CWASA personnel.

**TRAINING** : Training of CWASA counterpart staff would result a National benefit. CWASA will be better able to formulate and prepare future projects.

**MANAGEMENT IMPROVEMENT** : There is no direct scope of management improvement under this TAPP, but the training and technology transfer to CWASA staff would result in tangible benefit towards increasing efficiency and management improvement.

**INSTITUTIONAL SUPPORT**: This project will serve to improve the institutional capacity of WASA with regard to project preparation formulation and final Engineering design of different components of the project and preparation of tender documents , evaluation and execution of works.

### **ACTION EXPECTED AFTER COMPLETION OF THE PROJECT (33)**

This project will provide the basis (1) for the Donor to appraise the proposed and (2) to prepare a PCP & PP for the investment project.

**TAPP- PART-F- 1****PROJECT INPUTS PERSONNEL (34)****EXPATRIATE PERSONNEL**

SL NO	DESIGNATION	NOS	MAN MONTHS		Total MM	COST MONTHS TK. IN LAC.	TOTAL COST TK. IN LAC.
			field office	Home office			
1.	Water supply Engr. (Project Manager)	1	6	4	10	3.2	32.0
2.	Water supply Engr.(1)	1	5	3	8	3.0	24.0
3.	Water supply Engr.(2)	1	3	2	5	3.0	15.0
4.	Electrical Engr.	1	2	1	3	2.8	8.4
5.	Mechanical Engr.	1	3	0	3	2.8	8.4
6.	Hydrologist	1	3	0	3	2.6	7.8
7.	Socio-Economist	1	1	2	3	2.6	7.8
8.	Economist	1	1	3	4	2.8	11.2
9.	Environmental Engr.	1	2	1	3	2.8	8.4
10.	Chemist	1	3	0	3	2.6	7.8
Total : approximately		10	29	16	45		130.8

JICA may change above figures and designation for expatriate according to their needs.

**TASK AND QUALIFICATION REQUIRED (35)****QUALIFICATION AND EXPERIENCE**

SL NO.	DESIGNATION	QUALIFICATION AND EXPERIENCE	TASKS
1	Water Supply Engr. (Project Manager)	to be determined by JICA	Overall Management of the study
2.	Water Supply Design Engr.(1)	to be determined by JICA	Planning and designing of water treatment plant.
3.	Water Supply Design Engr. (2)	to be determined by JICA	Planning and designing of trunk and distributions mains.
4.	Electrical Engineer	to be determined by JICA	Design of electrical works and equipments
5.	Mechanical Engineer	to be determined by JICA	Design of mechanical works and equipments
6.	Hydrologist	to be determined by JICA	Hydrological works
7.	Socio-Economist	to be determined by JICA	Socio economic study
8.	Economist	to be determined by JICA	Economic analysis and Management
9.	Environmental Engineer	to be determined by JICA	Environmental assessment
10.	Chemist	to be determined by JICA	Water quality analysis

## JUSTIFICATION

This study has been proposed for implementation under Japanese grant. The foreign consultant is required because of non-availability of experts in the line locally for this expertise work for conducting feasibility study of Extension & Expansion of Mohara Treatment Plant system to undertake planning and design and preparation of cost estimate and basic design drawings for Extension and Expansion of Mohara Water Treatment Plant in Chittagong including Trunk & distribution mains and other related works.

The proposed Extension & Expansion of Mohara Water Treatment Plant has been proposed for implementing under Japanese Grant. Therefore, a future re-feasibility study by the Donor is a must for financing investment project.

### LOCAL CONSULTANT(36)

#### (IN ASSOCIATION WITH MOHARA WATER TREATMENT PLANT SET-UP)

SL. NO.	DESIGNATION	NOS	MAN MONTHS	COST PER MONTH TAKA IN LAC.	TOTAL COST TK. IN LAC.
1.	Water Supply Engr. Dy. Project Manager	0	0	0.00	0.00
2.	Sanitary Engineer	0	0	0.00	0.00
3.	Design Engineer	0	0	0.00	0.00
4.	Electrical Engineer	0	0	0.00	0.00
5.	Mechanical Engineer	0	0	0.00	0.00
6.	Hydrologist	0	0	0.00	0.00
7.	Socio Economist	0	0	0.00	0.00
8.	Computer Programmer	0	0	0.00	0.00
9.	Topographical Engr.	1	2	0.40	0.80
Total :		1	2	0.40	0.80

JICA may change the above figures for local consultants according to their needs.

In case the Government of Japan conducts the feasibility study, the Japanese Expatriate Personnel (Japanese consultants) who may be selected by and contracted with JICA will choose and contract with the Local Consultant(s) and the Project Personnel Others (local project staff), if necessary.



**Task and Qualification required(37)**

SL NO	DESIGNATION	QUALIFICATION & EXPERIENCE	TASKS
1.	Water Supply Engr. (Dy. Project Manager)	M.Sc.Engg. Water Supply/sanitary Engineering, planning and Environmental Engineering with experience of 15 years or more.	Overall Management and to assist Project
2.	Civil Engineer	Bachelor in Civil Engineering, Specialized in water analysis work with experience of 8 years or more.	Water Supply work system analysis
3.	Water Supply Design Engineer	Bachelor in Civil Engineering, Specialized in Water Supply Design & Net-work with experience of 10 years or more.	Water Supply design and net-work analysis
4.	Electrical Engr.	Bachelor in Electrical Engineering with experience of 10years more.	Electrical system analysis and design.
5.	Mechanical Engineer.	Bachelor in Mechanical Engineering with experience of 10 years more.	Mechanical system analyst and design.
6.	Hydrologist.	Master in Hydrology with experience of 12 years or more.	Hydrological work.
7.	Socio -Economist	Master in Economics with experience of 12 years or more.	Socio- Economic Study.
8.	Computer Programmer	M.Sc. in computer Science with 5 years experience or more.	Computer Programming and operating.
9.	Topographical Engineer	Bachelor in topographical survey with 5 years practical experience.	To conduct Topographical survey and to determine the actual position of project area.

**JUSTIFICATION**

The local consultant will be an integral part of the consultant team. Specific responsibility of the local consultants will be to carry out under guidance and as directed by the expatriate consultants, the necessary field investigation with regard to analysis and review of water supply system and different components with special attention to review and assess their relevant project activities and environmental impacts. The local consultant will maintain liaison with the concerned Ministry, CWASA and Department of Environment (DOE) counterpart personnel and the expatriate consultants.

Project Personnel GOB (38) (Chittagong WASA)	No. of Staff available Full Time (39)	No. of Staffs available Part Time (40)
(i) Project Director		1 No.
(ii) Assistant Engineer		1 No.
(iii) Sub Assistant Engineer		2 No.
(iv) Supporting Office Staffs		3 No.

No. of Staffs to be required (41) Designation	NO	Task & Qualification Required (42) Tasks	Qualification
1. Project Director	1	Project Management and Project Coordination work with the Consultants Interministries and Donor Agency.	B. Sc. Engineer with 15 years Experience in the line.
2. Assistant Engineer	1	He will help the project Director in the proposed project work.	B. Sc. Engineer with at least 5 years experience in the line.
3. Sub Assistant Engineer	2	He will assist the Project Director and Assistant Engineer in the project work.	Diploma in Engineering with 10 years experience.
4. Supporting Staffs	3	They will assist in all official work.	Graduate or H.S.C. passed with experience in official work and typing work.
Total	7		

#### PROJECT PERSONNEL OTHERS (43)

S/N	DESIGNATION	NOS.	MAN MONTHS	COST PER MONTH	TOTAL COST TK. IN LAC
1.	Administrative Officer	0	0	0.00	0.00
2.	Accountant	0	0	0.00	0.00
3.	Draftsman	1	6	0.24	1.44
4.	Surveyor	0	0	0.00	0.00
5.	Clerk Cum Typist	0	0	0.00	0.00
6.	Guards	0	0	0.00	0.00
7.	Peon	0	0	0.00	0.00
	Total	1	6	0.24	1.44

JICA may change above figures and designation for Project Personnel Others according to their needs.

**TASKS AND QUALIFICATION REQUIRED :**

SL/NO	DESIGNATION	TASKS	QUALIFICATION
1.	Administrative officer	Handling all official/Administrative matters and personnel Administration.	Master in Business Administration with 10 years experience.
2.	Accountant	Handling all accounts and financial matters	B. Com. with minimum 5 years experience.
3.	Draftsman	Work on necessary Design & Drawing.	Diploma in Drafts manships 5 years experience.
4.	Surveyor	To conduct survey work	Bachelor in Civil Engineer Specialized in survey work with experience 10 years or more.
5.	Clerk Cum Typist	Prepare reports and office correspondence	H.S.C. with 5 years work experience & Typing.
6.	Drivers	To drive all office Vehicles and maintain.	S.S.C. with 10 years experience with License.
7.	Guards	To maintain security of the office.	S.S.C. with 5 years experience as guard.
8.	Peon	To assist in office work.	S.S.C. Passed.

**ESTIMATED PERSONNEL COST (44)**

Year	Total cost Tk. In lac	Expatriate Consultants	Local Consultants	Project Personnel GOB	Project Personnel Others
F/Y 1	67.78	65.4	0.4		0.72
F/Y 2	67.78	65.4	0.4		0.72
Total	135.56	130.8	0.8		1.44

\* F/Y means Bangladesh fiscal financial year. It may include six months in 97-98 and six months in 98-99.

In case the Government of Japan conducts the feasibility study, the Japanese Expatriate Personnel (Japanese Consultants) who may be selected by and contracted with JICA will choose and contract with the Local Consultant(s) and the Project personnel Others (local project staff), if necessary.

**TAPP PART- F-2 PROJECT INPUT EQUIPMENTS:****SPECIFICATION OF ITEMS(45)**

SL.NO.	Equipments & Macluneries	Quantity	Cost Tk. Lac
1.	Photocopy Machine	1	5.00
2.	Computer	3	6.00
3.	FAX (Facsimail)	1	1.50
4.	Transportation	3	12.00
5.	Stationary & OTHERS	L.S.	14.50
Total			39.00

Photocopy machine, computer ,facsimail and jeep/car may be used on rental/payment basis. There is no need to purchase these items. Other equipments are to be deter mined by the Japanese consultants.

The Jeeps/cars are required for the Expatriate personnel for execution of the project. The vehicles which owned by Chittagong WASA are old and these are being used in the project maintenance work. So it is not possible on the part of Chittagong WASA to provide vehicles to the Consultants to their work. The consultants are to cover their services to the whole of the Chittagong city area so it will not be possible on their part to render their services without transportation. ~~Therefore, it is very much justified and required to procure vehicles under this proposed project.~~

**ANNUAL PHASING OF ESTIMATED COSTS (46)**

FY-1	FY-2	Total (Taka)
19.50	<del>22.02</del> 19.50	<del>41.52</del> 39.00

**TAPP PART-F-3 : PROJECT INPUT TRAINING**

Specification (47)	Institution (48)	No. of (49) Participants	Cost(50) TK. in lac
1. Water supply	Japan	2 No.	4.26
2. Management	Japan	2 No.	4.26

**ANNUAL PHASING OF ESTIMATED COST (51)**

FY 1	FY 2	Total
4.26	4.26	8.52

**TAPP PART F-4 : PROJECT OTHERS.****SPECIFICATION OF ITEMS (52)**

SL. NO.	HEAD OF EXPENDITURE	COST TK. LAC
1.	Preparation of design & report	15.00
2.	Rental Charge(Photocopy machine, computer, facsimile and jeep/car	39.00
3.	Insurance for Expatriates	5.20
4.	Air fare (Round trip-16) for expatriate	16.00
5.	Lodging charge for Expatriate	12.00
6.	Overhead Cost (10%)	8.72
Sub Total		95.92
GOB COST ( In lac.)		
1.	CDVAT	5.00
2.	Income-tax (for expatriate)	32.00
3.	Office Rent	5.00
4.	Office Operating Charge	5.00
5.	Site Work Expenses	5.00
6.	Misc.	5.00
Sub Total		57.00
Grand Total		152.92

The total amount of 57.00 lacs have been shown as GOB cost in the T.A.P.P. (Part F-4) out of which an amount of Tk. 5.00 lacs will be spent for payment of CDVAT concerning other charge for the importable items if required.

**ANNUAL PILASING OF ESTIMATED COSTS (53)**

FY-1	FY-2	TOTAL TK. IN LAC
90.00	62.92	152.92

PROVISION IN FIVE YEAR PLAN (54)  
NIL

PROVISION IN ADP/ATAP(55)  
NIL

**NO. OF ENCLOSURES**

NAME & SIGNATURE OF THE HEAD  
OF THE EXECUTING AGENCY.

*Sultan Mahmud Chowdhury*  
28.7.97  
(Sultan Mahmud Chowdhury.)  
CHAIRMAN  
CHITTAGONG WASA, CHITTAGONG

NAME AND SIGNATURE OF THE  
RECOMMENDING AUTHORITY(56)

*MD. HEFAZUDDIN*  
MD. HEFAZUDDIN  
Director General,  
Local Government Division  
Govt. of the People's Republic  
of Bangladesh.

Comperative Cost Estimates of the Approved and Revised Project.

Items	Approved estimate				Revised estimate			
	Quntv.	Cost			Quntv.	Cost		
		Local	F.Ex.	Total		Local	F.Ex.	Total
1. Project input personnel (Expatriate personnel)	50 mm	-	144.00	144.00	45 mm	-	130.80	130.80
2. Local Consultant	76 mm	-	31.50	31.50	2 mm	-	0.80	0.80
3. Project personnel others	132 mm	-	20.46	20.46	12 mm	-	3.96	3.96
4. Project input Equipments	L.S.	-	33.30	33.30	L.S.	-	39.00	39.00
5. Project input Training	L.S.	-	11.36	11.36	L.S.	-	6.00	6.00
6. Project input others	L.S.	-	88.82	88.82	L.S.	-	95.92	95.92
7. GOB Cost		21.60	-	21.60		57.00	-	57.00
		21.60	329.44	351.04	-	57.00	276.48	333.48

# **TERMS OF REFERENCE (TOR)**

(REVISED)  
FEASIBILITY STUDY ON  
EXTENSION AND EXPANSION OF  
MOHARA WATER TREATMENT PLANT.

APRIL 1997

***CHITTAGONG WATER SUPPLY AND SEWERAGE  
AUTHORITY***

***CHITTAGONG WASA  
DAMPARA, CHITTAGONG***

## INTRODUCTION :

Chittagong, the Second largest city of the People's Republic of Bangladesh lying in the South East part of the country, is situated on a peninsula bounded on the West by the Bay of Bengal and on the East by the Karnaphuly River.

The City is endowed with an ideal natural port shaped by the Karnaphuly River, which is blessed with not only the major seaport but also the major industrial center with the emphasis on large industries of the country. The Chittagong Export Processing Zone (CEPZ), the first export processing Zone of the country, has been established in the panoramic location of Patenga also along the beachline.

Another highlight for the industrial sector of Chittagong is a fertilizer plant which was constructed in late 1987 with a joint finance of several organizations. The operation of this plant has already contributed to the national agriculture production and trading, and to boost the development of the city so extensively that Chittagong could be leading the country's economy.

Marine products such as fish, prawn crab or shell are also the major products of Chittagong and most of which are sent to Dhaka for domestic use. These products are being taken at the mouth of Karnaphuli river by fishermen of small boats.

The Chittagong Development Authority (CDA) was established in 1959, which is responsible for urban planning and development of Chittagong and surroundings. The urbanization in the old city covers a mixture of residential areas, industries, trades and offices. The city center is so congested that population densities are as high as 350 inha/ha. or more. A redevelopment has been envisaged by CDA to provide adequate housing, infrastructure and social facilities.

The Chittagong Water Supply and Sewerage Authority (CWASA) was established in 1963 to be responsible for the planning, implementation and operation of the water supply and sewerage system in the Chittagong Municipality. By the great effort of CWASA the Water Supply of the city has been so improved that the two water purification plants have a total supply capacity of 40 MGD (181,818,18 cu.m/day) which are serving water to 60% total population.

Since the beginning of activity of CWASA, the considerable amount of assistance in both financial and technical aspects was provided by the World Bank for the water supply.

The latest feasibility study for third Chittagong Water Supply and sanitation project was made in 1988. The IDA formulated Third Chittagong Water Supply sub project "is an extension and rehabilitation of existing tubewells in city and Kalurghat Well field, distribution system, a well regeneration programme, institutional support and purchase of miscellaneous plant equipments. The IDA participation is conditional on GOB instituting institutional and financial reforms. In order to meet the present water demand in the existing system, CWASA has undertaken GOB funded interim projects.



## 2. BACKGROUND INFORMATION:

### 2.1 Urban Circumstance :

The City of Chittagong, the "Beauty queen of the Bangladesh" with its sublimity and the mountainous terrain has undergone rapid development : Although the southern part of the peninsula is flat and low lying, just north of the old Chittagong and extending to beyond the northern municipal area number of low sandy hills, several of which exceed 30m in elevation. The coastal areas in the west are flat, and are subject to devastating cyclones and tidal bores.

The major portion of the populated area is located on a peninsular plateau surrounded by low lying areas where there are main water mains.

Chittagong is criss-crossed by excellent roads and served by good transport system, buses, taxis, hire-cars, coaches and rickshaws, and connected internally by airlines and trains. A great number of multi storied flats have been built on the each side of the main street forming a shopping center area. Thanks to the geographically blessed location in the Bay of Bengal, the port of Chittagong handling the bulk of the export and import of the country is situated on the right bank of the Karnafuly River at a distance of about 15km from the shoreline.

The major industrial Zone within the city limits are the Kalurghat, Patenga, Fouzderhat and Sholashahar Estates together with a number of smaller industries.

### 2.2 Population:

The present population of Chittagong Metropolitan City is about 24 lacs which is likely to increase upto 30 lacs by 2000 AD.

### 2.3 Water Supply Situation:

Chittagong WASA was established in 1963 and took over the public water supply system from the then Chittagong Municipality, Public Health Engineering Department and Housing & Settlement Directorate. At that time the water supply was being made from 15 Nos. of tube wells located in the different parts of the city with a total yield of 3.5 MGD.

The first phase development of the water supply system under IDA credit No. 367-BD was started in 1966 and a total 14 nos. of Tubewells were installed in Kalurghat wellfield area with a total average yield of about 10 MGD. The project was completed in the year 1978. Meanwhile, because of high iron Concentration in the tubewell water, the yield started reducing due to clogging of strainers. To augment and rehabilitate the

water production 5 more tubewells were installed in Kalurghat and city area in 1982 under GOB fund. In the years from 1981-1987, the Second Chittagong Water Supply Project was completed under IDA Credit No.1001-DB in which 10 more tubewells were constructed at Kalurghat and City Area. This project also included the surface water treatment plant at Mohara having a capacity of 20 MGD and other ancillary structure. Thereby the ground water production at Kalurghat increased to 15 MGD and in city area to 5.00 MGD. The total production Capacity was 40 Million Gallons per day (MGD).

#### 2.4 Necessity of the Project :

It has been observed that tube-well water at Kalurghat and in city Area contains Iron in the ranges from 2.5 to 5 PPM. Because of high Iron concentration in water, the well screens get clogged very rapidly and thereby the yield of the tubewells is reduced. To keep the ground water production in optimum level from those wellfields, Chittagong WASA has started a programme of Regeneration and Rawhiding of existing tubewells but the improvement is very poor and is for a short time and the yield from tubewells again comes down to the low level. At present the supply from 30 Nos. of tubewells is about 10 MGD and from the surface water Treatment Plant is another 20 MGD i.e. the total supply is 30 MGD. Whereas the total demand as per present population is 75 MGD. As the total production has gone down to a considerable level, an interim project under GOB financing has been taken up by Chittagong WASA from January 1993 and will be completed by June 1997. This project includes 20 more tubewells so that the present crisis can be tackled and solved on completion of this project and water production will increase upto 40 MGD.

This is the time Chittagong WASA and GOB should go ahead for some permanent solutions to cater to the needs of the ever increasing population of Chittagong City and their water demand. So, it is suggested that the capacity of existing Mohara Water Treatment Plant should be made double and unserved areas of the City may be brought into the WASA Project area.

According to present population, the water demand is about 75.00 Million Gallons per day. for meeting this demand the proposed Extension of Mohara Water Treatment Plant with all ancillary works from the Halda River is required to be implemented soon. After completion of this project water production capacity will be increased by another 20.00 Million Gallons per day and which will meet the demand of city population.

### **3. OBJECTIVES OF THE STUDY**

The objectives of the Study are :

- 3.1 to formulate a basic plan for improvement of Extension and Expansion of Mohara Water Treatment Plant (hereinafter referred "MTP") and trunk, distribution mains, for the target year 2010.
- 3.2 to conduct a feasibility study on the priority project(s) selected from the basic plan, and
- 3.3 to transfer technology on planning methods and skills to counterpart personnel in the course of the Study.

### **4. STUDY AREA**

The Study area cover MTP. and its service area as shown in the attached map. Annex A

### **5. SCOPE OF THE STUDY**

#### **Phase 1      Basic Study**

5.1 Understanding of present conditions of study area through existing data, documents and field observations;

- (1) physical conditions (meteorology, topography, geology.)
- (2) socio-economic conditions and trends (population, industries, land use, social infrastructure, economic conditions, awareness of the citizens on environmental sanitation, etc.)
- (3) development plans and policies.
- (4) environment conditions ( public health and hygiene, potable water quality, environmental quality standards, environmental laws and regulations, etc.)
- (5) financial conditions
- (6) legislation and regulations concerned with potable water management
- (7) conditions of water supply management (physical, operational, institutional, financial, economic, social, environmental aspect, related on-going and planned projects, policies and legislation)
- (8) other infrastructure

## 5.2 Evaluation of present conditions of water supply management and identification of problems and issues with emphasis on

- (1) physical aspects
- (2) operational aspects
- (3) legal and institutional aspects
- (4) financial aspects
- (5) socio-economic aspects
- (6) environmental aspects
- (7) relevant plans

## 5.3 Review of MTP

- (1) structure, capacity, actual condition and performance of the plant.
- (2) actual condition of water sources.

## 5.4 Review of trunk and distribution mains.

Hydraulic analysis of trunk and distribution mains (by using the data and output of ("UNACCOUNTED FOR WATER MANAGEMENT PROGRAMME"))

## 5.5 Formulation of planning framework, forecasting

- (1) population growth and urbanization
- (2) economic growth and changes in living conditions
- (3) industrial growth
- (4) trends in meteo-hydrology
- (5) water demand

## 5.6 Formulation of the Basic Plan

- (1) establishment of basic policies, goals and strategies on;
  - a. service ratio
  - b. per capita consumption of water by area
  - c. water quality
  - d. institutional and operational structure
- (2) comparative study of technical alternatives of water supply scheme on such aspects as;
  - a. source of water
  - b. treatment and distribution system arrangements in the supplied area
  - c. priority and phasing

- (3) selection of the best alternative through comparisons on;
  - a. technical soundness
  - b. financial costs
  - c. cost effectiveness
  - d. environmental impacts
  - e. efficiency of institutional and operational arrangement
- (4) schematic lay-out of facilities
- (5) unaccounted for water (UFW) reduction plan by applying the output of  
"UNACCOUNTED FOR WATER MANAGEMENT PROGRAMME"
- (6) operation and maintenance plans of facilities
- (7) plans for strengthening institutional capacity of Chittagong Water Supply and  
Sewerage Authority(CWASA) with emphasis on:
  - a. managerial capability
  - b. institutional and organizational structure
  - c. staffing and manpower development
  - d. financial management and effective tariff collection
- (8) financial plans including;
  - a. preliminary cost estimation
  - b. target level of cost recovery
  - c. policy on mobilizing financial resources for investment
  - d. tariff policy and billing system
- (9) phased implementation plan
- (10) identification of priority project(s)
- (11) conduct of Initial Environmental Evaluation(IEE) for the priority project(s)
- (12) recommendations

## **Phase II    Feasibility study on the priority project(s)**

5.7 In-depth survey and supplementary data collection such as topography, geology, hydrology, meteorology, and environment

5.8 Establishment of basic policies for feasibility study

5.9 Preliminary design of facilities

5.10 Equipment plan

5.11 Construction plan

5.12 Operation, maintenance and promotion plans on;

- (1) guidelines for proper operation
- (2) preventive maintenance
- (3) rehabilitative maintenance
- (4) managerial capability
- (5) organizational structure
- (6) staffing and manpower development
- (7) public education

5.13 Financial plan

- (1) target level of cost recovery
- (2) policy on mobilizing financial resources for investment
- (3) tariff policy
- (4) privatization

5.14 Cost estimation

5.15 Implementation plan

5.16 Environmental Impact Assessment(EIA)

5.17 Comprehensive project evaluation including;

- (1) technical aspects
- (2) legal and institutional aspects
- (3) financial aspects

- (4) social aspects
- (5) economic aspects
- (6) environmental aspects

## 6. REPORT

JICA shall prepare and submit the following reports in English to the Government of Bangladesh.

### 6.1 Inception Report:

Twenty (20) copies at the commencements of the study in Bangladesh.

### 6.2 Progress Report:

Twenty (20) copies at the end of the work (Phase I) in Bangladesh.

### 6.3 Interim Report:

Twenty (20) copies at the beginning of the second work (Phase II) in Bangladesh.

### 6.4 Progress Report (2):

Twenty (20) copies at the end of the second work (phase II) in Bangladesh.

### 6.5 Draft Final Report:

Twenty (20) copies at the beginning of the third (phase II) in Bangladesh. The Government of Bangladesh shall submit its comments within one (1) month after JICA's receipt of the Draft Final Report.

### 6.6 Final Report:

Fifty (50) copies within one (1) month after the receipt of the comments of the Draft Final Report.

## 7. STAFFING

It is estimated the total input to be provided by expatriate consultant will be approximately 45 man-month.

### 7.1 Expatriate :

SL	Designation	Nos.	Total M/M
1.	Water Supply Engineer (Project Manager)	1	10
2.	Water Supply Engineer(1)	1	8
3.	Water Supply Engineer(2)	1	5
4.	Electrical Engineer	1	3
5.	Mechanical Engineer	1	3
6.	Hydrologist	1	3
7.	Socio-Economist	1	3
8.	Economist	1	4
9.	Environmental Engineer	1	3
10.	Chemist	1	3
	Approximately	10	45



## 7.2 Local Consultant

SL/NO	Designation	Nos	Man-month
1.	Water Supply Engr. Dr. Project Manager	0	0
2.	Sanitary Engineer	0	0
3.	Design Engineer	0	0
4.	Electrical Engr.	0	0
5.	Mechanical Engr.	0	0
6.	Hydrologist	0	0
7.	Socio- Economist	0	0
8.	Computer Programmer	1	2
9	Topographical Engr.	0	0
Total		1	2

## 7.3 Project Personnel Other

SI/NO	Designation	Nos	Man-month
1.	Administrative Officer	0	0
2.	Accountant	0	0
3.	Draftsman	0	
4.	Surveyor	1	6
5.	Clerk-Cum-Typist	0	0
6.	Driver	0	0
7.	Guard	0	0
8.	Peon	0	0
Total		1	6

JICA may change the above figure and designation of 7.1, 7.2, 7.3 according to their needs.

In case the Government of Japan conducts the feasibility study, the Japanese Expatriate Personnel (Japanese consultants) who may be selected by and contracted with JICA will choose and contract with the Local Consultant(s) and the Project Personnel Others (local project staff), if necessary.

## **8. SCHEDULE OF THE STUDY**

The Study will be carried out in accordance with the tentative schedule as attached (Annex B) herewith. The schedule is tentative and subject to be modified when both parties agree upon any necessity that will arise during the course of the Study.

## **9. PROVISION OF ACCOMMODATION BY THE GOVERNMENT :**

### **9.1 Provision of data and information**

The Government of the people's Republic of Bangladesh (hereing after reference to as "the Government" will provide to the Consultant all necessary assistance information and data that will be required for the execution of this study, as well as the office space and counterpart staffs during the period of the fields work in Bangladesh.

### **9.2 Access of land**

The Government will warrant to give the consultant a permission for free access to land as necessary for this study.

### **9.3 Texation and Duties**

The Government will exempt the Consultant from custom duties, internal taxes and other fiscal levies which may be imposed in Bangladesh.

### **9.4 Provision of Action Plan for Construction of Extension of Mohara Water Treatment plant and other works.**

The Government will provide to the Consultant the implementing action plan for construction of Mohara Treatment Plant Extension and other ancillary.

SCOPE OF WORK  
FOR  
THE FEASIBILITY STUDY ON EXTENSION AND EXPANSION  
OF MOHARA WATER TREATMENT PLANT  
IN  
CHITTAGONG  
IN  
THE PEOPLE'S REPUBLIC OF BANGLADESH  
AGREED UPON BETWEEN  
CHITTAGONG WATER SUPPLY AND SEWERAGE AUTHORITY  
AND  
THE JAPAN INTERNATIONAL COOPERATION AGENCY

## I. INTRODUCTION

In response to the request of the Government of the People's Republic of Bangladesh (hereinafter referred to as "the Government of Bangladesh"), the Government of Japan decided to conduct the Feasibility Study on Extension and Expansion of Mohara Water Treatment Plant Study in the People's Republic of Bangladesh (hereinafter referred to as "the Study") in accordance with the relevant laws and regulations in force in Japan.

Accordingly, the Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation programs of the Government of Japan, will undertake the Study in close cooperation with the authorities concerned of the Government of Bangladesh.

The present document sets forth the Scope of Work with regard to the Study.

## II. OBJECTIVES OF THE STUDY

The objectives of the Study are:

1. to formulate a basic plan for improvement of Extension and Expansion of Mohara Water Treatment Plant (MTP), trunk and distribution mains, for the target year 2010.
2. to conduct a feasibility study on the priority project(s) selected from the basic plan, and
3. to transfer technology on planning methods and skills to counterpart personnel in the course of the Study.

## III. STUDY AREA

The Study area cover MTP and its service area as shown in the attached map.

## IV. SCOPE OF THE STUDY

Phase I Basic Study

1. Understanding of present conditions of study area through existing data, documents and field observations;
  - (1) physical conditions (meteorology, topography, geology, etc.)
  - (2) socio-economic conditions and trends (population, industries, land use, social infrastructure, economic condition, awareness of the citizens on environmental sanitation, etc.)
  - (3) development plans and policies
  - (4) environmental conditions (public health and hygiene, portable water quality, environmental quality standards, environmental laws and regulations, etc.)
  - (5) financial conditions
  - (6) legislation and regulations concerned with portable water management
  - (7) conditions of water supply management (physical, operational, institutional, financial, economic, social, environmental aspect, related on-going and planned projects, policies and legislation)

- (8) other infrastructure
- 2. Evaluation of present conditions of water supply management and identification of problems and issues with emphasis on
  - (1) physical aspects
  - (2) operational aspects
  - (3) legal and institutional aspects
  - (4) financial aspects
  - (5) socio-economic aspects
  - (6) environmental aspects
  - (7) relevant plans
- 3. Review of MTP
  - (1) structure, capacity actual condition and performance of the plant.
  - (2) actual condition of water sources
- 4. Review of trunk and distribution mains
  - (1) Hydraulic analysis of trunk and distribution mains (by using the data and output of "UNACCOUNTED FOR WATER MANAGEMENT PROGRAMME")
- 5. Formulation of planning framework, forecasting
  - (1) population growth and urbanization
  - (2) economic growth and changes in living conditions
  - (3) industrial growth
  - (4) trends in meteo-hydrology
  - (5) water demand
- 6. Formulation of the Basic Plan
  - (1) establishment of basic policies, goals and strategies on;
    - a. service ratio
    - b. per capita consumption of water by area
    - c. water quality
    - d. institutional and operational structure
  - (2) comparative study of technical alternatives of water supply scheme on such aspects as:
    - a. source of water
    - b. treatment and distribution system arrangements in the supplied area
    - c. priority and phasing
  - (3) selection of the best alternative through comparisons on:
    - a. technical soundness
    - b. financial costs
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    - e. efficiency of institutional and operational arrangement
  - (4) schematic lay-out of facilities
  - (5) unaccounted for water (UFW) reduction plan by applying the output of "UNACCOUNTED FOR WATER MANAGEMENT PROGRAMME"
  - (6) operation and maintenance plans of facilities
  - (7) plans for strengthening institutional capacity of Chittagong Water Supply and Sewerage Authority (CWASA) with emphasis on:
    - a. managerial capability

- b. institutional and organizational structure
- c. staffing and manpower development
- d. financial management and effective tariff collection
- (8) financial plans including:
  - a. preliminary cost estimation
  - b. target level of cost recovery
  - c. policy on mobilizing financial resources for investment
  - d. tariff policy and billing system
- (9) phased implementation plan
- (10) identification of priority project(s)
- (11) conduct of Initial Environmental Evaluation (IEE) for the priority project(s)
- (12) recommendations

## Phase II Feasibility study on the priority project(s)

- 1. In-depth survey and supplementary data collection such as topography, geology, hydrology, meteorology, and environment
- 2. Establishment of basic policies for feasibility study
- 3. Preliminary design of facilities
- 4. Equipment plan
- 5. Construction plan
- 6. Operation, maintenance and promotion plans on:
  - (1) guidelines for proper operation
  - (2) preventive maintenance
  - (3) rehabilitative maintenance
  - (4) managerial capability
  - (5) organizational structure
  - (6) staffing and manpower development
  - (7) public education
- 7. Financial plan
  - (1) target level of cost recovery
  - (2) policy on mobilizing financial resources for investment
  - (3) tariff policy
  - (4) privatization
- 8. Cost estimation
- 9. Implementation plan
- 10. Environmental Impact Assessment(EIA)
- 11. Comprehensive project evaluation including:
  - (1) technical aspects
  - (2) legal and institutional aspects

- (3) financial aspects
- (4) social aspects
- (5) economic aspects
- (6) environmental aspects

#### V. SCHEDULE OF THE STUDY

The Study will be carried out in accordance with the tentative schedule as attached herewith. The schedule is tentative and subject to be modified when both parties agree upon any necessity that will arise during the course of the Study.

#### VI. REPORTS

JICA shall prepare and submit the following reports in English to the Government of Bangladesh.

1. Inception Report:  
Twenty (20) copies at the commencement of the study in Bangladesh.
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Twenty (20) copies at the end of the first work (Phase I) in Bangladesh.
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Twenty (20) copies at the end of the second work (Phase II) in Bangladesh.
5. Draft Final Report:  
Twenty (20) copies at the beginning of the third work (Phase II) in Bangladesh.  
The Government of Bangladesh shall submit its comments within one (1) month after JICA's receipt of the Draft Final Report.
6. Final Report:  
Fifty (50) copies within one (1) month after the receipt of the comments on the Draft Final Report.

## VII. UNDERTAKINGS OF THE GOVERNMENT OF BANGLADESH

1. To facilitate the smooth conduct of the Study, the Government of Bangladesh will take necessary measures:
  - (1) to secure the safety of the Japanese study team (hereinafter referred to as "the Team"),
  - (2) to permit the members of the Team to enter, leave and sojourn in Bangladesh for the duration of their assignment therein, and exempt them from foreign registration requirements and consular fees,
  - (3) to exempt the members of the Team from taxes, duties, fees and any other charges on equipment, vehicles, and other materials brought into Bangladesh for the conduct of the Study,
  - (4) to exempt the members of the Team from income tax and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the Team for their services in connection with the implementation of the Study,
  - (5) to provide necessary facilities to the Team for the remittances as well as the utilization of the funds introduced into Bangladesh from Japan in connection with the implementation of the Study,
  - (6) to secure permission for the Team to enter into private properties or restricted areas for the implementation of the Study,
  - (7) to secure permission for the Team to take all data and documents including photographs and maps related to the Study out of Bangladesh to Japan, and
  - (8) to provide medical services in case of necessity. It's expenses will be chargeable to the members of the Team.
2. The Government of Bangladesh shall bear claims, if any arises, against the members of the Team resulting from, occurring in the course of, or otherwise connected with, the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the member of the Team.
3. CWASA shall act as a counterpart agency to the Team and also as a coordinating body in relation with other governmental and non-governmental organizations for the smooth implementation of the Study.
4. CWASA shall at its own expense, provide the Team with the followings, in cooperation with other organizations concerned:
  - (1) available data and information related to the Study,
  - (2) additional survey related to the Study, if necessary,
  - (3) counterpart personnel and supporting staff,
  - (4) suitable office space with necessary equipment in Chittagong
  - (5) credentials or identification card.

## VIII. UNDERTAKINGS OF JICA

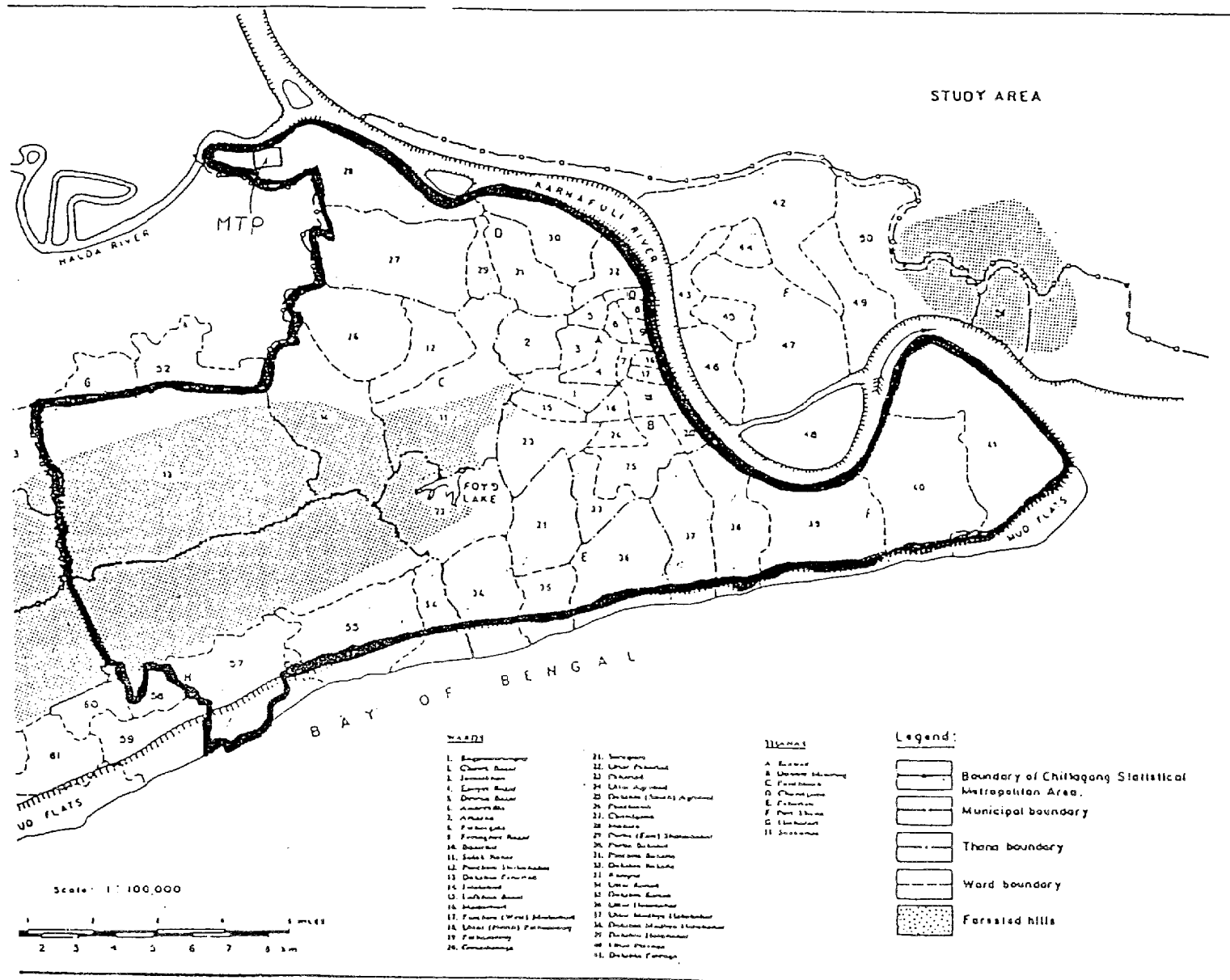
For the implementation of the Study, JICA shall take the following measures:

1. to dispatch, at its own expense, the Team to Bangladesh, and
2. to pursue technology transfer to counterparts personnel in the course of the Study.

## IX. CONSULTATION


JICA, CWASA, Ministry of Finance and Ministry of Local Government Rural Development and Co-operatives will consult with each other in respect of any matter that may arise from or in connection with the Study.



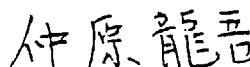


SCOPE OF WORK  
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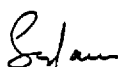
Dhaka, October 12, 1999




Mr. Kamrul Hasan  
Deputy Secretary  
Economic Relations Division,  
Ministry of Finance



Mr. NAKAHARA, Ryugo  
Leader  
Preparatory Study Team,  
Japan International Cooperation  
Agency



Mr. Serajul Islam  
Local Government Division,  
Deputy Chief  
Ministry of Local Government Rural  
Development and Co-operatives



Mr. Z. S. M. Bakhteyar  
Chief Engineer  
Chittagong Water Supply and  
Sewerage Authority

## I. INTRODUCTION

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The objectives of the Study are:

1. to formulate a basic plan for extension and expansion of Mohara Water Treatment Plant (hereinafter referred to as "MTP") and for improvement of trunk and distribution mains, for the target year 2010,
2. to conduct a feasibility study on the priority project(s) selected from the basic plan, and
3. to transfer technology on planning methods and skills to counterpart personnel in the course of the Study.

## III. STUDY AREA

The Study area covers MTP and its service area as shown in the attached map.

## IV. SCOPE OF THE STUDY

### Phase I Basic Study

1. Understanding of present conditions of study area through existing data, documents and field observations ;
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  - (2) socio-economic conditions and trends (population, industries, land use, social infrastructure, economic condition, awareness of the citizens on environmental sanitation, etc.)

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- (3) development plans and policies
  - (4) environmental conditions (public health and hygiene, portable water quality, environmental quality standards, environmental laws and regulations, etc.)
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- (1) Establishment of basic policies, goals and strategies on ;
    - a. service ratio
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    - c. water quality
    - d. institutional and operation structure of Chittagong Water Supply and Sewerage Authority(CWASA)
  - (2) comparative study of technical alternatives of water supply scheme on such aspects as ;
    - a. source of water
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- (3) selection of the best alternative through comparisons on ;
  - a. technical adaptability
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- (6) operation and maintenance plans of facilities
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  - c. staffing and manpower development
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- (11) conduct of Initial Environmental Evaluation (IEE) for the priority project(s)
- (12) recommendations

Phase II Feasibility study on the priority project(s)

1. In-depth survey and supplementary data collection such as topography, geology, hydrology, meteorology and environment
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  - (6) staffing and manpower development
  - (7) public education

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7. Financial plan

- (1) target level of cost recovery
- (1) policy on mobilizing financial resources for investment
- (2) tariff policy
- (3) privatization (e.g. contract-out)

8. Cost estimation

9. Implementation plan

10. Environmental Impact Assessment(EIA)

11. Comprehensive project evaluation including ;

- (1) technical aspects
- (2) legal and institutional aspects
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V. SCHEDULE OF THE STUDY

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Twenty (20) copies at the end of the second work (Phase II) in Bangladesh.

The Government of Bangladesh shall submit its comments within one (1) month after its receipt of the Draft Final Report.

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5. Final Report:

Fifty (50) copies within one (1) month after the receipt of the comments on the Draft Final Report.

VII. UNDERTAKINGS OF THE GOVERNMENT OF BANGLADESH

1. To facilitate the smooth conduct of the Study, the Government of Bangladesh will take necessary measures:

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- (5) to provide necessary facilities to the Team for the remittances as well as the utilization of the fund introduced into Bangladesh from Japan in connection with the implementation of the Study,
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- (7) to secure permission for the Team to take all data and documents including photographs and maps related to the Study out of Bangladesh to Japan, and
- (8) to provide medical services in case of necessity. It's expenses will be chargeable to the member of the Team.

2. The Government of Bangladesh shall bear claims, if any arises, against the members of the Team resulting from, occurring in the course of, or otherwise connected with, the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the member of the Team.

3. CWASA shall act as a counterpart agency to the Team and also as a coordinating body in relation with other governmental and non-governmental organizations for the smooth implementation of the Study.

4. CWASA shall at its own expense, provide the Team with the followings, in cooperation with other organizations concerned ;

- (1) available data and information related to the Study,
- (2) additional survey related to the Study, if necessary, R.N



- (3) counterpart personnel and supporting staff,
- (4) suitable office space with necessary equipment in Chittagong
- (5) credentials or identification card.

#### VIII. UNDERTAKINGS OF JICA

For the implementation of the Study, JICA shall take the following measures:

- 1. to dispatch, at its own expense, the Team to Bangladesh, and
- 2. to pursue technology transfer to counterparts personnel in the course of the Study.

#### IX. CONSULTATION

JICA, CWASA, Economic Relations Division (ERD), Ministry of Finance and Ministry of Local Government Rural Development Co-operatives will consult with each other in respect of any matter that may arise from or in connection with the Study.

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## Tentative Schedule

Description	1	2	3	4	5	6	7	8	9	10	11	12
Work in Bangladesh												
Work in Japan												
Report Presentation												

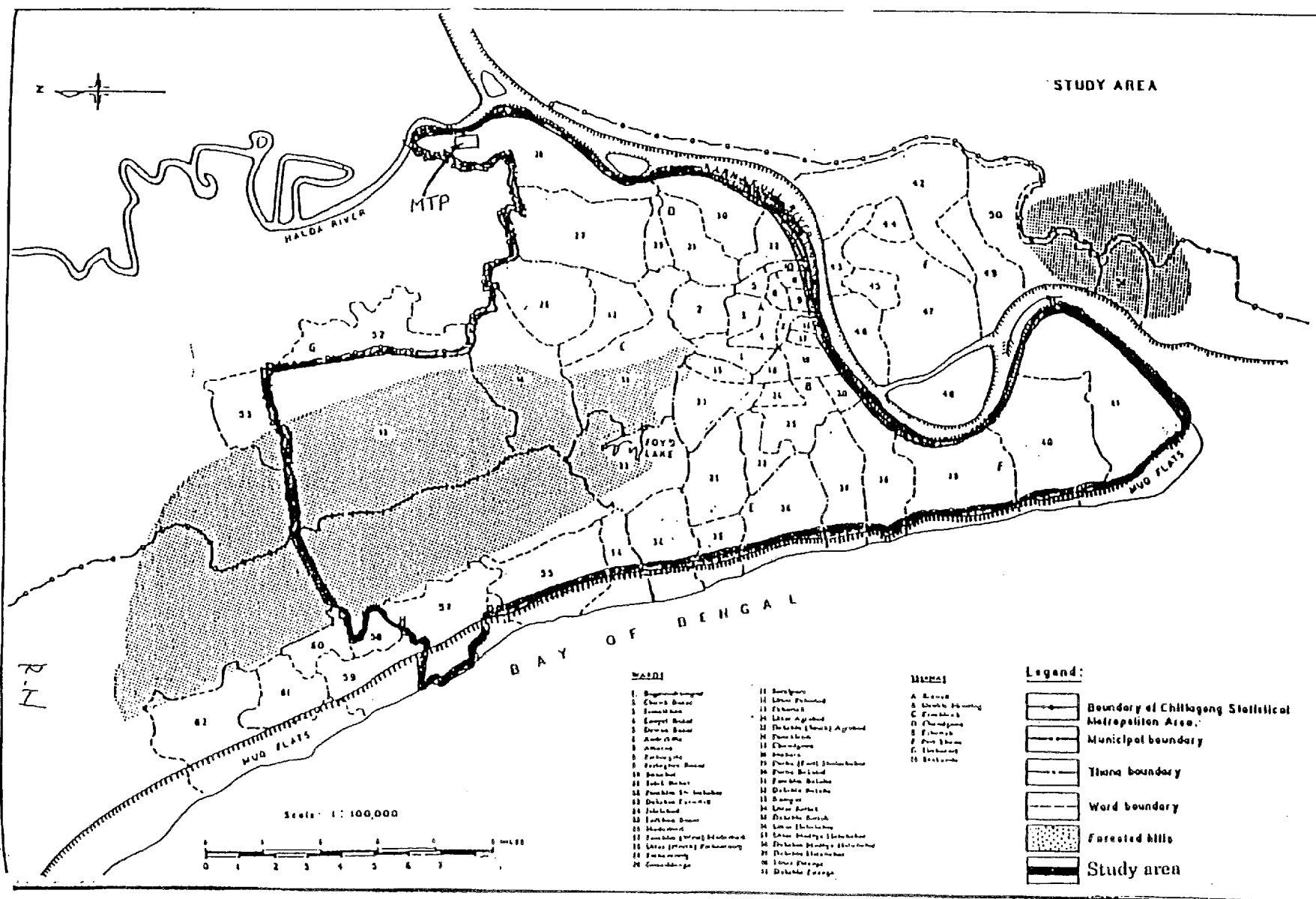
IC / R : Inception Report

P / R : Progress Report

IT / R : Interim Report

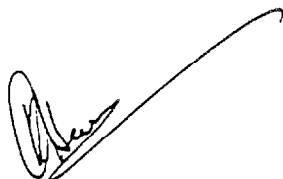
DF / R : Report

F / R : Final Report



MINUTES OF MEETINGS  
FOR  
THE FEASIBILITY STUDY ON EXTENSION AND EXPANSION  
OF MOHARA WATER TREATMENT PLANT  
IN  
CHITTAGONG  
IN  
THE PEOPLE'S REPUBLIC OF BANGLADESH  
AGREED UPON BETWEEN  
THE MINISTRY OF FINANCE  
AND  
THE JAPAN INTERNATIONAL COOPERATION AGENCY

Dhaka, October 12, 1999



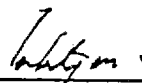
Mr. Kamrul Hasan  
Deputy Secretary  
Economic Relations Division,  
Ministry of Finance



Mr. NAKAHARA, Ryugo  
Leader  
Preparatory Study Team,  
Japan International Cooperation  
Agency



Mr. Serajul Islam  
Deputy Chief  
Local Government Division,  
Ministry of Local Government Rural  
Development and Co-operatives



Mr. Z. S. M. Bakhteyar  
Chief Engineer  
Chittagong Water Supply and  
Sewerage Authority

## I. INTRODUCTION

1. Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Preparatory Study Team (hereinafter referred to as "Team") for the Feasibility Study on Extension and Expansion of Mohara Water Treatment Plant in Chittagong in the People's Republic of Bangladesh (hereinafter referred to as "the Study"), headed by Mr. NAKAHARA, Ryugo, from 5 to 21 October, 1999.
2. The Team had a series of meetings to discuss the Scope of Work for the Study from 6 to 12 October with the related authorities, viz. the Economic Relations Division of Ministry of Finance(hereinafter referred to as "ERD"), Planning Commission, the Ministry of Local Government Rural Development and Co-operatives(hereinafter referred to as "LGRD") and Chittagong Water Supply and Sewerage Authority(hereinafter referred to as "CWASA"). This Minutes of Meetings summarizes the results of discussions. The list of participants is shown in the Attachment.

## II. RESULTS OF DISCUSSIONS

1. Background of the Study  
Bangladesh side explained as follows;  
Water supply in Chittagong City is in serious situation, at present service of CWASA covers only one-third of its population and safe sufficient water supply is essential needs for citizen to ensure stable life.  
For this purpose, Extension and Expansion of Mohara Water Treatment Plant has very important role and also citizen is sincerely expecting this project.  
This Feasibility Study is very important step for the project and also strongly expected to execute in short period as possible.  
  
The Team promised to convey these to Authorities concerned in Japan.
2. Review of trunk and distribution mains  
Both sides agreed that IV. Phase I Basic Study, 4." Review of trunk and distribution mains" would be conducted using the available data of pipelines for 300mm and above, essential 200mm pipelines.
3. Reports to be submitted  
All reports up to Draft Final Report will be submitted to CWASA for their review. Copies of all reports will be delivered to concerned Agencies of Ministries by CWASA. CWASA will submit comments on Draft Final Report to LGRD, and ERD of Government of Bangladesh. ERD will send the Draft Final Report with comments to JICA office in Bangladesh. JICA will prepare the Final Report incorporating the comments and submit the Final Report to ERD with copy to LGRD and CWASA.

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As for the Final Report, both sides agreed in principle to make it open to the public in order to achieve maximum use of the Study results. This issue, however, shall be discussed and finalized at time of Draft Final Consultation.

4. Undertaking of the Government of Bangladesh

The Bangladesh side promised to offer an office space in Chittagong including electric charge and water charge. But it explained not to be able to offer other utilities and also not to contribute additional survey due to its budgetary constraint.

The Team recognized the situation and promised to convey it to JICA Headquarter for consideration.

5. Equipment

The Bangladesh side requested that JICA would bring necessary equipment for the Study effectively and efficiently to conduct the Study as well as to ensure the transfer of technology. The Team explained that this issue would be discussed in Japan based upon the results of this preparatory study.

6. Counterpart Training in Japan

The Bangladesh side requested the Team to give training to counterpart personnel(s) in Japan.

The Team agreed to convey the request to JICA Headquarter.

7. Technology Transfer Seminar

The Bangladesh side requested the Team to hold a seminar at each time of submission of Interim Report and Draft Final Report as a part of technology transfer.

The Team agreed to convey the request to JICA Headquarter.

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## LIST OF PARTICIPANTS

(Bangladesh side)

### Ministry of Finance

Kamrul Hasan	Deputy Secretary, Economic Relations Division
M. H. Khan	Assistant Chief, Economic Relations Division
OMOTE, Shin'ichiro	Economic Cooperation Coordinator

### Planning Commission

Ziauddin Ahmed	Joint Chief, Physical Planning, Water Supply & Housing
NAKAMURA, Yoshikatsu	Economic Development Planning Advisor
Md. Abdullah Al Masud Chowdhury	Senior Assistant Chief

### Ministry of Local Government Rural Development and Co-operatives

A. H. M. Abul Qasem	Director General
Serajul Islam	Deputy Chief

### Chittagong Water Supply and Sewerage Authority

Captain M Zakaria	Chairman
Z.S.M. Bakhteyar	Chief Engineer
Md Ataul Haque	Superintending Engineer, Planning and Construction Circle
Md. Shafiqul Islam	Executive Engineer, Sales Division
Ejaz Rasul	Executive Engineer, Design Division
FIJISHIRO, Yuzo	Expert

### Bagladesh Bank

Noor-un-Nahar	Deputy Director
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(Japanese side)

### Japan International Cooperation Agency

ITO, Kozo	Deputy Resident Representative, JICA Bangladesh Office
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### Preparatory Study Team

NAKAHARA, Ryugo	Leader / Water Supply Planning
FUKUDA, Yoshio	Study Planning
FUKUDA, FUMIO	Water Supply Facility Planning
SUETAKE, Toru	Water Supply Management

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