# 添 付 資 料

TECHNICAL ASSISTANCE PROJECT PROPOSAL (TAPP)

# MASTER PLAN AND FEASIBILITY STUDY

FOR
THE DEVELOPMENT OF SEWERAGE SYSTEM IN NORTH DHAKA
( Revised )

DHAKA WATER SUPPLY & SEWERAGE AUTHORITY
WASA BHABAN
98,Kazi Nazrul Islam Avenue,Dhaka-1215

JANUARY,1995

TAPP PART-A : PROJECT

| PROJECT No.(1) | TAPP DATE (2) | REVISED (3) |
|---|---|---|
| TA ! ! ! ! | 18 ! 9 ! 1991 ! | 20 ! 9 ! 1994 |

| PROJECT TITLE (4) | ADMN.MINISTRY/DIVISION (5) |
|---|---|
| Master Plan and Feasibility study for Development of sewerage system in North Dhaka. | Ministry of LGRD & Co-operatives ( Local Govt.Division) |

| EXECUTIVE AGENCY (6) | SECTOR (7) | PROJECT DIRECTOR (8) |
|---|---|---|
| Dhaka Water Supply & Sewerage Authority (Dhaka WASA) | Physical Planning Water supply & Housing | Q.G. Mowla Superintending Engr. (SH&WC), DWASA. |

TAPP PREPARED BY ADDRESS & PHONE (9)

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TAPP PART-B : PROJECT DATES

| ACTUAL | START (10) | | PLANNED | COMPLETION (11) |
|---|---|---|---|---|
| MM | YY | | MM | YY |
| 12 | 94 | | 03 | 96 |

TAPP PART-C : PROJECT FINANCE

| DONOR (12) | LOCAL COST SOURCE (13) |
|---|---|
| Govt.of Japan (expected) | Nil |

| FOREIGN EXCHANGE SOURCE (14) | CURRENCY RATE (15) |
|---|---|
| Grant Aid Assistance from Japan Govt. | ¥ 2.50 =Taka 1.00 |

(TAKA IN LAKH)

| PROJECT COST | TOTAL COST (16) | F/E COST (17) | TAKA COST (18) | GOB COST (19) | PROJECT AID (20) | RPA AID (21) | OWN COST (22) |
|---|---|---|---|---|---|---|---|
| 1994-95 | 336.96 | 336.96 | - | | 336.96 | - | - |
| 1995-96 | 237.60 | 237.60 | - | - | 237.60 | - | - |
| TOTAL: | 574.56 | 574.56 | - | | 574.56 (¥ 143.64 million) | | |

For details please see ANNEX-I

| FINANCIAL AGREEMENT WITH DONOR (23) | None | Discussed | Exists |
|---|---|---|---|
| | | ✓ | |

| NAME/DESIGNATION OF DONOR CONTACT (24) | :Resident Representative of JICA, BANGLADESH. |
|---|---|

| FINANCING AFTER COMPLETION OF THE PROJECT (25) | FUNDS REQUIRED |
|---|---|
| Not Applicable | To be decided aftercompletion of the Study |

| MODE OF FINANCING (26): | DONOR LOAN | GRANT | GOB ADP BUDGET | REVENUE BUDGET |
|---|---|---|---|---|
| | | ✓ | | |

| SELF FINANCING (27) : | NIL |
|---|---|

TAPP PART-D.1

PROJECT DESCRIPTION (28)

a.INTRODUCTION

The urban population growth of the country is about 2.17% per annum.The growth rate for the major urban centres including Dhaka was more than 6% per annum.It is anticipated that by the turn of century the population of Dhaka City will exceed 10 million and will keep on growing.

b.BACKGROUND

Dhaka City is the capital of Bangladesh.The existing facilities of safe water supply and sewerage disposal system of Dhaka City are confined between central metropolitan area and old part of the Dhaka city i.e.up to Buriganga river.

Development of residential,commercial and industrial areas after 1965,rapidly inhabitated the surroundings of Dhaka Metropolitan area causing extension of the city limit to form a greater Dhaka City.Newly developed areas consists of Cantonment, Banani, Gulshan, Badda, Baridhara, Uttara, Tongi, Savar and some parts of Mirpur and Mohammadpur area.

To cope with the rapid extension of the city and demand for sewage disposal in newly developed areas, DWASA did some piecemeal extension of sewage disposal facilities, but such extensions are inadequate for future use.

Those who would construct house/building in the area are regulated to provide a septic tank individually in order to treat on-site the night soil generated in the house/building. The sludge and effluent of the septic tank should be disposed off properly from time to time. Non-availability of proper sanitation facilities are resulting in health hazard to the inhabitants and mass environmental pollution. In response to the said situation, DWASA must formulate an upto date Master Plan for development of sewerage system, for which the execution of this project is of utmost importantance.

c.Necessity of Master Plan.

North Dhaka is rapidly expanding as a residential area where the work of sewerage facilities should be started from now on . Therefore,planning and implementation of the project should be integrated with the urban development planning. At the same time, feasible basic plan (target year, population, volume of drainage, way of disposal, level of service and alternative sewerage, disposal system) should be prepared, taking into account that construction of sewerage facilities is extremely costly.

Based on the above steps, a feasibility study on a priority project should be carried out.

The main objective of this project is to develop sewerage facilities in rapidly urbanized area precedent to other areas.

The detailed scope of work of the study is given below;

I. Phase I : Master Plan Study

i) Collection and review of existing data

a) Social and economic conditions

b) Natural conditions

c) National and regional development plans

d) Existing sewerage system

e) Institutional and financial aspects of Dhaka WASA.

f) Urban development plans and other urban infrastructure

g) Environmental conditions and relevant laws and regulations

h) Other relevant data

2) Field reconnaissance

a) Geological and topographical conditions

b) Hydrological conditions

c) Existing water supply facilities

d) Existing conditions of sanitation and domestic waste water disposal

e) Environmental conditions

f) Other relevant data

3) Evaluation of current conditions and projection of future trends in urbanization

4) Formulation of a master plan

a) Determination of planning framework
- Target year
- Population growth

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- Increase in the amount of water use
- Increase in the amount of waste water and change in its quality

b) Determination of goals and targets for the development of sewerage system
- Target level of water environment and sanitary condition

c) Comparison of technical alternatives
- Target coverage rate in terms of population and area
- Zoning of area by means of disposal and treatment
- Definition of sewerage scheme
- Mode of collection
- Possibility of relying on " Low cost sanitation "
- Level of the quality of treated water and mode of treatment
- Phasing of project implementation

d) Layout of the best alternative

e) Plan for the institutional and operational aspects

f) Rough estimation of cost

g) Financial plan and financial evaluation

h) Evaluation of the Master Plan

i) Implementation plan

5) Identification of a priority project

a) Identification of a priority project

b) Initial environmental examination

Phase II : Feasibility Study

1) Confirmation of planning framework

2) Supplementary and in-depth data collection

3) Determination of design criteria and preliminary design of facilities

4) Operation and maintenance plan

5) Institution and management plan

6) Cost estimation

7) Financial plan

8) Environmental impact assessment

9) Project evaluation

10) Implementation plan

2. Level of service

There is little possibility that " conventional sewerage system " can be established in the " entire service area " in 20-30 years. Therefore, zoning of areas may be done and conventional sewerage system or alternative suitable method may be considered judging the level of socio-economic conditions of the inhabitants.

3. Design parameter

In addition to "using modern technology ", low cost sanitation (small bore system/shallow sewer) should be taken into consideration owing to the same reason mentioned in above 2.

4. Preliminary design/drawing for sewerage system

The capacity of sewerage treatment plant should be decided on the basis of the result of the study.

5. Submission of consultants report

It should be as follows.

| Repotrs | period | No. of copies |
|---|---|---|
| a) Inception Report | On 1st month | 10 copies of each. |
| b) Progress Report(1) | On 4th month | |
| c) Interim Report | On 7th month | |
| d) Progress Report (2) | On 11th month | |
| e) Draft Final Report | On 14th month | |
| f) Final Report | On 16th month | |

6. Required Period of study

Phase - I about 7 months
Phase -II about 9 months
Total : about 16 months.

7. JUSTIFICATION FOR MASTER PLAN

The history of sewerage system in Dhaka city is long, dating back to 1923. Narinda pump station and the Imhoff-tank type sewage treatment plant were built in that year by the British government, the ruling Govt. at that time. But this project was limited to only old Dhaka city until the early 1940. The system has been expanded since then adding little by little as the population of the city grew rapidly. In 1977 the Pagla sewage treatment plant with a planned capacity for half a million people was built.

No Master plan for sewerage system of Dhaka Metropolitan area was prepared by Dhaka WASA earlier. As the city was expanded both horizontally and vertically resulting more increase of population therefore Dhaka WASA now is actively considering in the preparation of a Master Plan for sewerage system of Dhaka city. The population of the city is increasing very rapidly and now it is going tobe a mega city by the year 2000. Therefore a Master Plan for sewerage system for the whole city is extremly needed. Current problems for the Sewerage system of Dhaka City can be classified into 2(two) categories. One is a basic need for expansion and improvement of sewerage facilities in order to cope with the fast growing population in the city and in newly developed surrounding areas. The other is the urgently need for improvement and repairs of existing facilities which have become inadequate/ obsolete.

DWASA carried out a feasibility study in 1981 with an aid of International Development Association for strengthening the water supply and sewerage facilities as a part of the urban infrastructure construction project of Dhaka, the rapidly developing city. In the feasibility study, the main purpose of sewerage project was to extend the sewage treatment system, including the provision of sewerage in the newly developed areas. However, the execution of the project was later abandoned mainly due to the adverse economic reasons.

Under the circumstance, Dhaka WASA has worked out an Emergency improvement programme of the existing facilities and requested the Japan Govt. in Sept 1986 for the execution of programme in grant assistance. In order to conclude the basic design study on the Sewerage Construction and Rehabilitation project for Dhaka city the Japanese expert aimed at the rehabilitation or replacement of superannuated pumps among the existing ones, as well as the expansion of sewage treatment plant of inefficient treatment capacity.

DWASA discussed with the Basic Design Team of project and repeatedly indicated the necessity to include the improvement and repair of the existing sewerage system in the scope of the project in order to put the sewerage system in good services. Subsequently the basic design team expressed their opinion that as there was no up to date Master Plan for the sewerage system in Dhaka city, a detailed Master Plan should be prepared prior to execution of the request of DWASA.

The existing sewerage treatment plant situated at Pagla,south of Dhaka city is under capacity of taking all load of sewage disposal from 18 lift pump stations in and around central Dhaka. Besides requirement for house connection towards the existing sewerage system is expected to increase and also general improvement of the environmental circumstances in the area is of utmost necessity.Therefore, considering expansion of Dhaka Metropolitan areas towards its northern part, this introduction of the proposed sewerage system is urgently needed.

9.REASONS FOR MODIFICATION :

A TAPP named Feasibility Study and Detailed Design Drawings for construction of sewerage facilities at North Dhaka with a cost of Tk. 501.44 lakh. was prepared in August, 1991 and was recommended to approve it in principle by SFEC on 5.1.92. It was also approved to request the Donor Agency officially to finance the project. Subsequently if there is any change in cost or TOR after discussion with the Donor a revised TAPP has to be submitted to planning Commission for approval.

The Importance of the project was discussed in a meeting held in ERD with the Japanese annual consulting mission during August,16- 21,1992 and the mission was requested to include the project in the grant assistance list.The reply from Japanese side was that necessary documents would be required for detailed examination prior to include it in the giant assistance list.At this the Japan govt. was requested in August,93 to finance the project under the technical grant assistance. The Japan Govt. informed Bangladesh on June 23,1993 that " Govt. of Japan takes high interest in this study and so ERD is requested to propose this study again for FY 1994".The TAPP has been included in the FY 1994-95 and TK.1.00 lakh as project Aid has been allocated against the project. Since the fund has not yet been lined up the project could not be started.The Embassy of Japan, Dhaka informed ERD on April 19,1994 that,

i) Japan is not able to conduct both the Feasibility Study (F/S) and the Detailed Design (D/D) in a single project. In order to conduct D/D, they have to examine the request for the grant assistance ( which was composed of Basic Design, Exchange of Notes, detailed Design and construction works) with analyzing the result in the F/S reports.

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ii)It is not possible to carry out the F/S in the whole region of North Dhaka.The Master plan should be prepared prior to the feasibility study is being done.

In this connection ERD is requested by the Embassy of Japan , Dhaka to modify the title of the project by using" Master Plan and Feasibility Study for Construction of sewerage facilities at North Dhaka"

A discussion meeting was held on May 29.1994 in the M/O LGRD and Cooperatives (Local Govt. Division).The comments of Japan Govt. was discussed in detail and it was decided to modify the TAPP according to the comments of Japan Govt.and to submit the same to ERD at an early date.Accordingly the TAPP has been modified.

JICA Bangladesh office sent comments on the modified draft TAPP and Terms of reference (TOR) on August 31, 1994 . According to the comments of JICA Bangladesh office the TAPP including the terms of Reference (TOR) has been revised.

The SPEC meeting was held on 22-11-94 The TAPP was discussed in details in the meeting and was recommended to approve subject to recast the same by justifying /incorporating the following issues/ points as mentioned below:

| Recommendations of SPEC Meeting held on 22.11.94) | DHAKA Comments |
|---|---|
| a) Justification for revision of the TAPP, reasons for item wise increase of expenditure with an enclosure of a comparative statement of revised and original cost of the TAPP. | Justification for revision of the TAPP is given in article 8 at page 9. The cost of revised TAPP in TK was increased from 501.44 lakh to TK. 574.56 lakh due to conversion rate of Japanese Yen in TK. But the cost in Yen was decreased from Yen 195.56 million to Yen 143.64 million. An item wise comparative statement of original & revised cost of the TAPP is given at Appendix- A. |
| b) The Implementation of the project is to be started after getting assurance of Japanese grant assistance. | The project can be started with the assurance of Japan Govt. Grant assistance. ERD may be requested to line up Japanese grant assistance. |

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| | |
|---|---|
| c) There should be a clause in the TAPP that no Master plan of the sewerage system for Dhaka city was done before. | No Master Plan was prepared by DWASA for the sewerage system earlier.<br><br>Justification for Master Plan is given in article 7 at page-8. |
| d) A map showing the proposed sewage disposal area is to be enclosed with this TAPP. | The relevant map as required is enclosed at Appendix-C. |
| e) The qualifications and experiences of the consultants with TOR in details is to be enclosed in the TAPP and it is to be approved by Local Govt. Division/DWASA. | The qualifications and experience of the consultants have been furnished in article(35) of TAPP at page 14 to 16.The relevant task(TOR)of the consultants is attached in Appendix-B. |
| f) Selection process for Foreign Training(subject matter, duration, place of Training, relevant Ministry/ Organization) is to be given in the TAPP. But one candidate from the relevant wing of the Planning Commission is to be included. | The actual training requirement of the personnel to be decided by the Donor Agency during the visit of the JICA Preliminary mission in Bangladesh. |
| g) A cost break down with justification for lodging charge, supplementary expenses and over head cost of the project is to be given in the TAPP. | Residential accommodation, such as, house rent hotel expense will be met up from lodging charge. Supporting services like survey work, soil testing and boring testing will be met up from supplementary cost. Expatriate home office back up service including the profit of the consulting firm is included in the over head cost. Detailed break up of these items is not possible to show before negotiation with the relevant consultant prior to start the project. |

TAPP PART-D.2 :PROJECT OBJECTIVES (29)

The objectives of the project in brief are ;

i) To prepare a Master Plan for the long-term development of a sewerage system and its proper management in the Northern part of Dhaka City.

ii) To identify a priority project that needs to be implemented at the first stage of development.

iii) To develop a plan for the priority showing its technical,economic and financial viabilities.

CONSEQUENCES IF NOT APPROVED (30)

Dhaka,the capital of Bangladesh is one of the fast growing city in the World.Its sewage treatment facilities is becoming increasingly critical with every passing year. The present sewerage system and treatment plant is not able to keep pace with growing demand.

The present (June,1994) sewage capacity of PAGLA STP is about 120 000 $m^3$ per day(26 IMGD).By future rehabilitation of the existing damaged trunk sewer lines , the existing sewage disposal plant capacity can be upgraded upto 180 000 $m^3$/per day (40 MGD).
At the end of 2010 AD, demand of sewage disposal capacity of central Dhaka City, including Eastern and South-western part, will be about 540,000 $m^3$/per day(120 IMGD). The PAGLA sewer treatment Plant was built for the services of the above mentioned areas. For the future increase of house service connections and growing population and because of the other reasons there is no scope for connections and disposal of sewer in-flow from Northern side of the Dhaka metropolitan city to PAGLA sewage treatment plant.

The long term demand of sewage disposal for greater Dhaka City, specially its northern part, can not be met by the existing Sewerage Treatment Plant for which it needs to have a second disposal plant considering future utility.

Hence, another Sewage Treatment Plant at least with a capacity of 180,000 $m^3$ per day(40 IMGD) is urgently needed to be built. Moreover, due to resource constraints the city sewerage system could not be developed with the growing demand for sewage disposal facilities. The city is growing fast, both horizontally and vertically. If necessary measures to solve the problem of its sewage disposal are not undertaken

urgently,the situation is likely to become critical in the near future. But development of these facilities need large investment from International Aid giving Agencies.

Without having the feasibility study proposed in this TAPP, the request for international financing can not be submitted. Hence this project needs to be undertaken on priority basis.

LINKAGE TO OTHER PROJECT/ORGANIZATION (31)

The findings of this study will be incorporated for preparation of the detailed design,drawings for sewage treatment plant.A similar type of project was implemented by Dhaka WASA. It will have direct linkage to the other projects and it will be also linked with the scope of services of the organization.

PART-B

PROJECT OUTPUT (32)
(IN QUANTITATIVE AND QUALITATIVE TERMS)

Preparatory Assistance :

(a) The consultants will submit a Master Plan for the long term development of a sewerage system and its proper management in the northern part of Dhaka City.

(b) The consultant will submit the result of the feasibility study of the priority project.

TECHNOLOGY TRANSFER:

Five counter part personnel of Dhaka WASA from Planning and Engineering Divisions, will be involved during the study to work with a Japanese study Team. As a result they will develop their planning skills concerning technical and inatitutional aspect of a sewerage system through technology transfer.

TRAINING : Given at page at 14

INSTITUTIONAL SUPPORT : Not applicable for the TAPP.

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ACTION EXPECTED AFTER COMPLETION OF THE PROJECT (33)

After completion of the study, a project on the development of sewerage system will be commissioned at North Dhaka, if found feasible and financial source is available.

FAPP PART F.1 PROJECT INPUT PERSONNEL (34)

| EXPATRIATE | MAN-MONTH | NO. OF CONSULTANTS | Cost/man-month (TK. in lakh) |
|---|---|---|---|
| Total | 82 | 10 | 3.78 |

Note: For details please see ANNEX-II

FIELD AND QUALIFICATION REQUIRED (35)

| DESIGNATION | MAN-MONTH | TASK HISTORY AND QUALIFICATION REQUIRED |
|---|---|---|
| Team Leader/Sewerage Planner | 13.50 | Minimum M.Sc in Sanitary Engineering with 10 yrs. of relevant experience. |
| Urban development Planner | 6.00 | Minimum B.Sc in Civil Engineering with 7 yrs. of relevant experiences. |
| Sewerage facilities planner | 11.50 | Minimum B.Sc in Civil Engineering, 7 yrs. relevant experience in sanitation. |
| Sewerage Treatment Planner | 10.00 | Minimum B.Sc in civil Engineering, yrs. Similar experience in Sewerage Treatment facilities. |
| Sanitary Engineer | 8.00 | Minimum post graduate in civil Engr. 5 yrs. similar experience in Sanitary Engineering and sewerage system. |

* Given in appendix-B

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| | | |
|---|---|---|
| 6. Water quality and environmental Engr. | 7.50 | Minimum B.Sc in civil engeering. 5 yrs experience of in Environmental aspect. |
| 7. Design facilities Engineer. | 6.00 | Minimum B.Sc. engr.in Electrical & Mech.Engr |
| 8. Construction plan & cost estimator. | 4.50 | Minimum diploma in civil Engr.Specialized in construction and preparation of cost estimates for sewerage plant. |
| 9. Institution & organizational Expert. | 7.00 | Minimum post graduate Specialized in industrial works. |
| 10. Socio- Economic conditions/project Evaluation Expert. | 8.00 | Post graduate in Economics /socio-Economic activity analysis. |
| Total | 82.00 | |

| LOCAL CONSULTANT (36) | MAN MONTH | NO.OF CONSULTANTS | COST PER MAN-MONTH (TK. IN LAKH) |
|---|---|---|---|
| CONSULTANT | 19 | 7 | 0.50 |

Note: For details please see Annex -III

TASK AND QUALIFICATION REQUIRED (37)

| DESIGNATION | MAN-MONTH | SPECIALIZATION |
|---|---|---|
| 1. Sewerage planner | 4 | Sanitary Engeering. |
| 2. Urban development | 4 | .Civil Engeering. |
| 3. Design Specialist | 3 | Architect., Engeneering. |
| 4. Water quality & Environmental speciliest. | 2 | Post graduate in hydrology. |
| 5. Socio-Economist | 2 | Master Degree in Economics. |
| 6. Institution Specialist | 2 | Master Degree in Public Administration. |
| 7.Project Evaluation Specialist. | 2 | Master Degree in Statistics/Economics. |

| PROJECT PERSONNEL,GOB (38) | NO.OF STAFF AVAILABLE FULL TIME (39) | NO.OF STAFF AVAILABLE PART TIME(40) |
|---|---|---|
| Counterpart Personnel | | |
| 1.Mr. Quazi Gholam Howla, | SE(S.H.K.c) | 1 |
| 2.Mr. Bazlur Rahman, | XEN(Procurement)- | 1 |
| 3.A.F.M. Abdul Aziz | A.E(Crash program) | 1 |
| 4.Mr. S.A. Malek | Deputy Chief(Planning) | 1 |
| 5.Mr. M.A. Jalil | AC(Planning & Monitoring) | 1 |
| Sub-total: | | 5 |

| NO.OF STAFF TO BE REQUIRED (41) | TASK AND QUALIFICATION REQD.(42) |
|---|---|
| Nil | Not Applicable |

PROJECT PERSONNEL OTHERS (43) :

| MAN-MONTH | NO.OF PERSONNEL | COST/MAN-MONTH (TK.IN LAKH) |
|---|---|---|
| 104 | 14 | 0.15 |

Note : For details please see ANNEX III

ESTIMATED PERSONNEL COST (44) :

| COST (TK.In lakh) | EXPATRIATE CONSULTANT | LOCAL CONSULTANT | PROJECT(GOB) PERSONNEL | PROJECT(OTHER) PERSONNEL |
|---|---|---|---|---|
| FY-1 (1994-95) | 155.93 | 4.75 | | 5.32 |
| FY-2 (1995-96) | 155.92 | 4.75 | | 5.32 |
| TOTAL : | 311.85 | 9.50 | | 10.64 |

TAPP PART-F.2

PROJECT INPUT :OFFICE EQUIPMENT AND MACHINERIES (45)

Please see details in ANNEX - IV

TAPP PART F.3

PROJECT INPUT : TRAINING

| SPECIFICATION(47) | INSTITUTION(48) | NO.OF PARTICIPANTS.(49) | COST(50) |
|---|---|---|---|
| Not applicable. | To be decided as per requirement. | 4. personnel (counter parts) | Tk.12.00 lakh * (Airfare and other expenses) |

* The actual training requirement interms of no. of personnel and training expenses will be determined by JICA.

ANNUAL PHASING OF ESTIMATED COST (51)

| FUND | FY-1 | FY-2 | TOTAL (in lakh Tk.) |
|---|---|---|---|
| Foreign | 6.00 | 6.00 | 12.00 |
| Local | - | - | - |
| Total | 6.00 | 6.00 | 12.00 |

TAPP PART F.4

PROJECT INPUT - OTHERS (52)

Note : Please see details in ANNEX - V

ANNUAL PHASING OF ESTIMATED COST (53)

| FUND | FY-1 | FY-2 | TOTAL (in lakh Tk.) |
|---|---|---|---|
| Foreign | 68.23 | 68.23 | 136.46 |
| Local | - | - | - |
| Total | 68.23 | 68.23 | 136.46 |

PROVISION IN FIVE YEAR PLAN (54)

TK.124100.00 lakh has been allocated for DWASA in FFYP

PROVISION IN ADP/ATAP (55)

Tk. 1.00 lakh in ADP 1994-95.

2.2.95
Nasir Ahmed
Chairman
Dhaka Water Supply & Sewerage Authority.

NAME AND SIGNATURE of the Head of the Implementing Agency.

(সৈয়দ নূরুদ্দোজা হোসেন)
যুগ্ম পরিচালক
স্থানীয় সরকার বিভাগ,
গণপ্রজাতন্ত্রী বাংলাদেশ সরকার

NAME AND SIGNATURE of the Recommending Authority.

## SUMMARY COST

ANNEX-I

| PARTICULARS | TOTAL AMOUNT (Tk.In lakh) |
|---|---|
| 1.Expatriate Consultant | 311.85 |
| 2.Local consultant and staff | 20.14 |
| 3.office equipments and Machineries | 10.35 |
| 4.Vehicles and Transportation | 30.00 |
| 5.Office Expenses | 10.10 |
| 6.Recurring Expenses | 3.36 |
| 7.Trainning | 12.00 |
| 8.Report Preparation and meetings of the consultants. | 20.00 |
| 9.Insurance | 1.00 |
| 10.Lodging charge (lump-sum ) | 40.00 |
| 11.Supplementary cost | 20.00 |
| Sub-Total : | 478.80 |
| 11.Over head (20% of Sub- Total) | 95.76 |
| TOTAL : | Tk.574.56 (Y 143,640,000) |

ANNEX-II

DETAILS OF EXPATRIATE MAN-MONTH COST ESTIMATES :

( Cost in Tk.)

| Sl. No | DESIGNATION | NO.OF CONSULT. | MAN-MONTH Total | COST/MM | TOTAL |
|---|---|---|---|---|---|
| 1. | Team Leader/ Sewerage planner | 1 | 13.5 | 5,80,000 | 78,30,000 |
| 2. | Urban Development Planner. | 1 | 6.00 | 480,000 | 28,80,000 |
| 3. | Sewerage facilities Planner. | 1 | 11.50 | 270,000 | 31,05,000 |
| 4. | Sewerage Treatment planner. | 1 | 10.00 | 410,000 | 41,00,000 |
| 5. | Sanitary Engr. | 1 | 8.00 | 410,000 | 32,80,000 |
| 6. | Water quantity & Environmental Engr. | 1 | 7.50 | 330,000 | 24,75,000 |
| 7. | Designer of facilities. | 1 | 6.00 | 270,000 | 16,20,000 |
| 8. | Construction planner & cost estimator. | 1 | 4.50 | 410,000 | 18,45,000 |
| 9. | Institution & Organizational expert. | 1 | 7.00 | 70,000 | 18,90,000 |
| 10. | Socio-Economic conditions/ project evaluation Expert. | 1 | 8.00 | 270,000 | 21,60,000 |
| | TOTAL : | 10 | 82.00 | | 31,185,000 (Y 77,962,500) |

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ANNEX- III

D. LOCAL CONSULTANTS(SALARY COST):

(In Taka)

| Particulars | Unit | Period (MM) | Cost/per month | Total cost |
|---|---|---|---|---|
| 1. Sewage planner | 1 | 4 | 50,00,000.00 | 2,00,000.00 |
| 2. Urban development Planner | 1 | 4 | 50,00,000.00 | 2,00,000.00 |
| 3. Design Specialist | 1 | 3 | 50,00,000.00 | 1,50,000.00 |
| 4. Water quality and Environmental Specialist | 1 | 2 | 50,00,000.00 | 1,00,000.00 |
| 5. Institutional Specialist | 1 | 2 | 50,00,000.00 | 1,00,000.00 |
| 6. Socio-Economist | 1 | 2 | 50,00,000.00 | 1,00,000.00 |
| 7. Project Evaluation | 1 | 2 | 50,00,000.00 | 1,00,000.00 |
| Sub-Total: | 7 | 19 | | 9,50,000.00 |

E. OTHER PERSONNEL (SALARY COST)

| | | | | |
|---|---|---|---|---|
| 1.Surveyor | 3 | 4 | 10,000.00 | 1,20,000.00 |
| 2.Administrative officer | 1 | 16 | 15,000.00 | 2,40,000.00 |
| 3.Account | 1 | 16 | 8,000.00 | 1,28,000.00 |
| 4.Computer Operator | 2 | 12 | 6,000.00 | 1,44,000.00 |
| 5.Driver | 2 | 16 | 6,000.00 | 1,92,000.00 |
| 6.Draftsman | 1 | 8 | 6,000.00 | 48,000.00 |
| 7.Guard | 2 | 16 | 3,000.00 | 96,000.00 |
| 8.Peon | 2 | 16 | 3,000.00 | 96,000.00 |
| sub-total: | 14 | 104 | | 10,64,000.00 |
| Total: | 21 | 123 | | 20,14,000.00 |

Note: Local consultants and other personnel as mentioned above can on the basis of a sub - contract with the Japanese consulting firm which will be selected after completion of necessary formalities. According to the procedures followed by JICA a JICA Preliminary Mission will come first and then will determine the scope of works. Consultants will recruit the local consultants and other personnel in consultation with JICA depending on the scope of works and project requirement.

ANNEX-IV

E. OFFICE EQUIPMENT & MACHINERIES

( Taka in lakh)

| Items | Quantity | Cost |
|---|---|---|
| 1. Water quality Analyzer & reagent | 1 | 1.00 |
| 2. Word processor | 1 | 1.00 |
| 3. Photo copier(AI) | 1 | 1.00 |
| 4. Drafting machine | 1 | 1.25 |
| 5. Computer printer | 2 | 2. |
| 6. Work desk/chairs | 10 sets | 1.00 |
| 7. Meeting Table (15 chairs) | 1 set | 0.50 |
| 8. Document Shelves | 2 sets | 0.20 |
| 9. Stationeries and others | | 2.00 |
| Total : | | 10.35 |
| | | ( Y 2,587,500) |

Note : The equipments and machineries may either be purchased or hired by the Japanese consultants.

OTHERS

A. VEHICLES AND TRANSPORTATION (Tk.in lakh)

| Particulars | unit | period | cost/month | Total |
|---|---|---|---|---|
| 1. 4 WD- Jeep | 02 | 16 | .093 6 | 30.00 |
| sub -Total | | | | 30.00 (Y 7,500,000) |

B. Office Expenses

| Particulars | Period | cost/month | Total |
|---|---|---|---|
| 1. Office rent | 16 mth | 30,000.00 | 4.80 |
| 2.Telephone (1 set) | 16 mth | 10,000.00 | 1.60 |
| 3.Fascimile (Fax 1 set) | 16 mth | 10,000.00 | 1.60 |
| 4.Air conditioner | 16 mth | | 0.60 |
| 5.Office furniture | 16 mth | | 1.50 |
| Sub-total | | | 10.10 (Y 2,525,000) |

C. RCURRING EXPENDITURE

| Particulars | Period | cost/month | Total |
|---|---|---|---|
| 1. Electric charge | 16 mth | 10,000.00 | 1.60 |
| 2. water charge | 16 mth | 5,000.00 | 0.80 |
| 3.office maintenance | 16 mth | 6,000.00 | 0.96 |
| sub -Total: | | | 3.36 (Y 840,000) |
| D. Training (5) | 1 mth (each) | 3,00,000.00 | 12.00 (Y 3,000,000) |

E. REPORT AND DESIGN PREPARATION

| Paticulars | Month | cost/month | Total |
|---|---|---|---|
| 1. Meetings of consultants and preperation of reports | 16 | 1.25 | 20.00 |
| Sub-total | | | 20.00 (Y 5,000,000) |
| E. Insurance | | | 1.00 |
| F. Lodging charge(lump -sum) | | | 40.00 |
| G. Supplementary cost | | | 20.00 |
| Sub -Total | | | 61.00 (Y15,250,000) |
| Total: | | | 136.46 (Y 34,115,000) |

APPENDIX-A

A COMPARATIVE STATEMENT OF ORIGINAL COST AND REVISED COST OF THE TAPP

(TK.IN LAKH)

| Sl No. | Main items | Approved TAPP Duration | Approved TAPP Cost | Revised TAPP Duration | Revised TAPP Cost | difference Duration (-) | difference Cost (+) | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1. | Foreign consultant. | 70 mm | 139.02 | 82 mm | 311.85 | +12 | +172.83 | Due to increase of Exchange rate between TK. & Y and increase of man-month. |
| 2. | Local consultant. | 37 mm | 13.40 | 123 mm | 20.14 | +86 | + 6.74 | -Do- |
| 3. | Office and Machineries. | | - | | 10.35 | | +10.35 | In consultant with JICA present cost estimate was prepared. |
| 4. | Vehicles and Transportation (exp 2 nos) | | 57.92 | | 30.00 | | -27.92 | -DO- |
| 5. | Office and recurring expenses. | | 18.95 | | 13.46 | | -5.49 | -Do- |
| 6. | Training (5 Persons). | | - | | 12.00 | | +12.00 | -Do- |
| 7. | Report and meetings of the consultants. | | 60.00 | | 20.00 | | -40.00 | -Do- |
| 8. | Insurance | | 1.00 | | 1.00 | | - | -Do- |
| 9. | Loding charge (lump-sum). | | 50.00 | | 40.00 | | -10.00 | -Do- |

25

| | | | | |
|---|---|---|---|---|
| 10.Supplementary cost | 20.00 | 20.00 | - | -Do- |
| 11.Overhead | 80.49 | 95.76 | +15.27 | Originaly profit of the consulting firm, Home office backup service et were not included |
| 12.Fixed expenditure | 6.10 | - | - 6.10 | This was omitted in consultantion with JICA. |
| 13.Site works | 46.40 | | -46.40 | -Do- |
| 14.Others | 8.16 | - | - 8.16 | -Do- |
| Total | 501.44 (Y 195.56 million) | 574.56 Y 143.64 million) | +73.12 | |

APPENDIX-B

## TASKS (TOR) OF THE CONSULTANTS

### (A) EXPATRIATE CONSULTANT

| Designation | | Task |
|---|---|---|
| 1. Team Leader/Sewerage planner | : | Management of the team for study work and discussion with GOB officials and concerned agencies. |
| | : | Study on sewerage system with comparison for alternative plans to be recommended taking into account of population and demand for water in the study area and operation/maintenance of the sewerage system. |
| | : | Preparation of discussion reports and study report. |
| 2. Urban development planner. | : | Review and evaluation on population and industries in the study area taking into account of present and future urban development plans and other urban infrastructure. |
| | : | Analyses of potential volume of demand for water and sewage in the thana level. |
| 3. Sewerage facilities planner | : | Study on sewerage/sanitary system taking into account of low cost sanitation and public sewerage system. |
| | : | Study on sewage collection system separate or combined systems to be employed for the new projected area. |
| | : | Formulation of master plan and feasibility study taking into account of the existing facilities and environmental aspect with alternative plans. |
| 4. Sewerage treatment planner | : | Study on treatment facilities with comparison for alternative plans. |
| | : | Layout and design of best alternative for treatment facilities. |

| | | |
|---|---|---|
| 5. Sanitary Engineer | : | Study on sewer line sought for transmission of sewage. |
| | : | Layout and design of best alternative for sewer and lift pump stations. |
| | : | Layout and design of low cost sanitation system |
| 6. Water quality and environmental Engineer | : | Study on urban development plans and other urban infrastructure from the view point of water use and environmental aspect. |
| | : | Study on environmental condition and relevant laws and regulations. |
| | : | Estimate of sewage quality generated from domestic, industries and others. |
| | : | Evaluation of environmental assesment. |
| 7. Design facilities Engineer | : | Study on local procurement of equipments and materials. |
| | : | Layout and design of best alternative for mechanical and electrical facilities. |
| | : | Cost estimation for mechanical and electrical facilities. |
| | : | Operation and maintenance plan. |
| 8. Construction plan and cost estimator | : | Study on local procurement of materials for civil work. |
| | : | Cost estimation for civil work. |
| | : | Support for sewerage planner for implementation /construction plant. |
| 9. Institutional and Organization Expert | : | Review/ study on present institution and organization. |
| | : | Operation and maintenance plan for best operation of the sewerage system. |
| | : | Institution and management plan for sewerage system operation. |

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| | | |
|---|---|---|
| 10. Socio-economic/ project evaluation Expert | : | Study on socio-economic situation |
| | : | Financial evaluation on DWASA. |
| | : | Financial plan and project financial evaluation. |

(B) LOCAL CONSULTANT.

| | | |
|---|---|---|
| 1. Sewerage planner (Assist to Expatriate Team leader/sewerage planner | : | Collection and review of existing data and information. |
| | : | Analysis of collected data and information. |
| | : | Study on alternative plans for sewerage system , sewer line and lift pump station |
| | : | Review of existing operation and menagement system for sewerage. |
| 2. Urban development (Assist to Expatriate urban development planner) | : | Collection and review of existing data and information in relation to urban development plans. |
| | : | Study on population and demand for water. |
| 3. Design specialist (Assist to Expatriate sewerage treatment planner and sanitary Engineer.) | : | Layout and design of best alternative for civil work and architect. |
| | : | Collection of regulation and local price of materials for civil and architect. |
| | : | Design of treatment facilities for concrete structure and building. |
| | : | Design of sewer and pump houses structure |
| 4. Water quality and environmental specialist ( Assist to Exp. water quality and environ mental engineer) | : | Collection and review of data and information in relation to water quality and environmental aspects. |
| | : | Study on law and regulation on environmental aspect. |

| | | |
|---|---|---|
| | : | Sampling and water quality analyses for sewage, industrial waste water and others. |
| 5. Socio-economist (Assist to Expat.socio-economical/project evaluation Expert.) | : | Collection and review of data and information in relation to socio-economic aspects. |
| | : | Analyses and evaluate the data collected. |
| | : | Financial evaluation on DWASA. |
| 6. Institution Specialist (Assist to Expat Institutional and organization Expert) | : | Collection and review of data and information in relation to institution and organization and management system. |
| | : | Evaluate DWASA organization and operation and management system. |
| 7. Project evaluation specialist (Assist to Exp. socio-economic/project evaluation Expert). | : | Collection and review of data and information in relation to other project evaluation on water supply and sewerage project. |
| | : | Study on project finance. |

file name: TRES.

APPENDIX - C

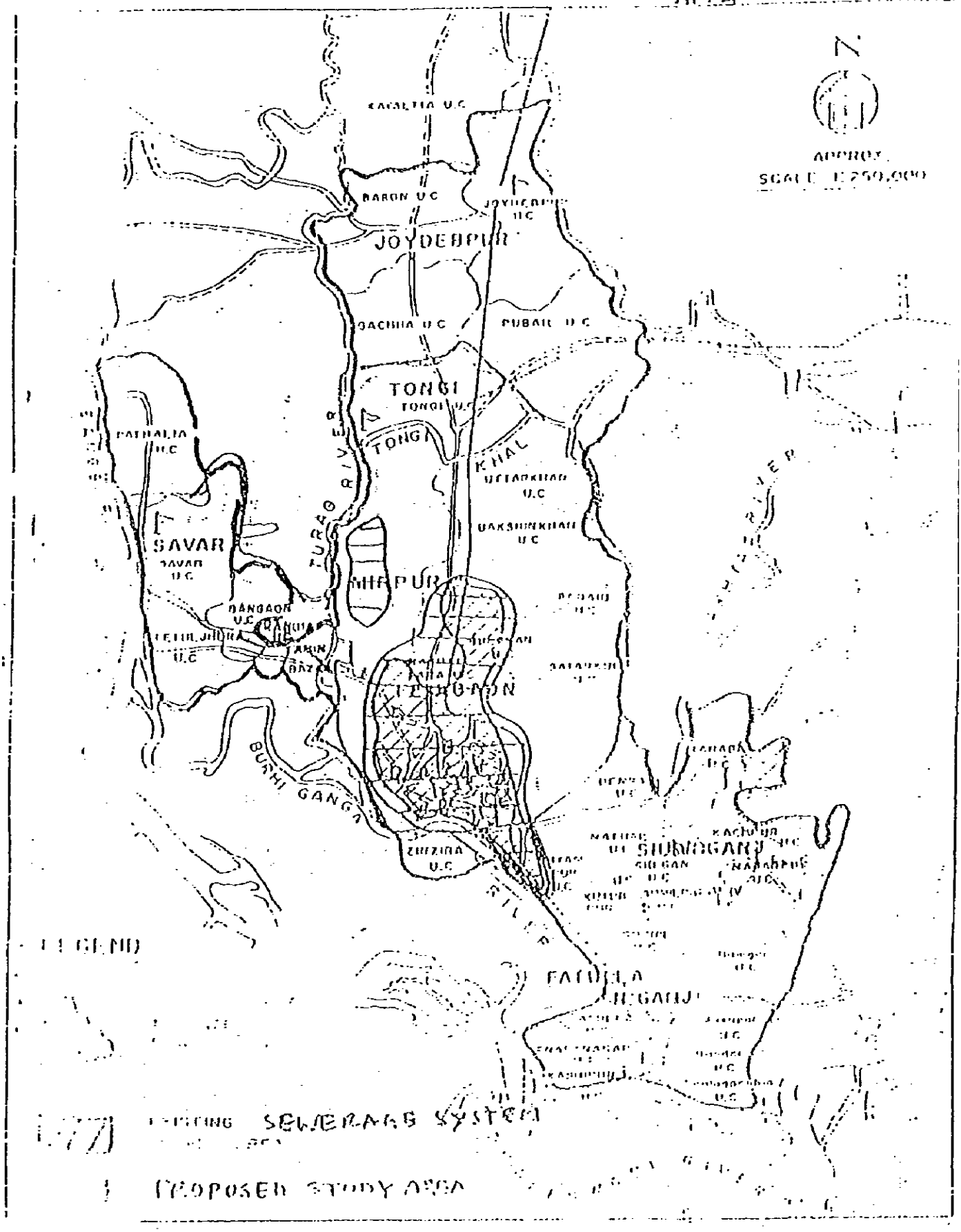



FIGURE 1.3 THE PROJECT AREA

SCOPE OF WORK

FOR

THE MASTER PLAN AND FEASIBILITY STUDY

FOR

THE DEVELOPMENT OF SEWERAGE SYSTEM

IN

NORTH DHAKA

IN

THE PEOPLE'S REPUBLIC OF BANGLADESH

AGREED UPON BETWEEN

THE MINISTRY OF FINANCE

AND

THE JAPAN INTERNATIONAL COOPERATION AGENCY

Dhaka, November,25, 1996

Mr. M. Azizul Islam
Deputy Secretary
Economic Relations Division
Ministry of Finance

高島英二郎

Mr. Eijiro TAKASHIMA
Leader
Preparatory Study Team
Japan International Cooperation
Agency

Mr. Serajul Islam
Deputy Chief (Planning)
Ministry of Local Government
Rural Development and Co-operatives

Mr. A. Malek
Deputy Chief (Planning)
Dhaka Water Supply and Sewerage Authority

## 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 Master Plan and Feasibility Study for the Development of Sewerage System in North Dhaka 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 master plan for improvement of wastewater management that contributes to the upgrading of sanitary and environment conditions and operation and maintenance in North Dhaka for the target year 2020, with reviewing existing plans; and

2. to conduct a feasibility study on the priority project(s) selected from the master 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 will cover North Dhaka. (The study area map is shown in the Appendix)

## IV. SCOPE OF THE STUDY

Phase I Master Plan

1. Collection and analysis of existing data and information of North Dhaka
   a) physical conditions (meteorology, topography, geology, etc)
   b) socio-economic conditions and trends (population, industries, land use, social infrastructure, economic condition, awareness of the citizens on environmental sanitation, etc)
   c) development plans and policies
   d) environmental conditions (public health and hygiene, sewarage effluent quality, drinking water quality, environmental quality standards, environmental laws and regulations, etc)
   e) financial conditions
   f) legislation and regulations concerned with wastewater management
   g) current network for wastewater and sewerage treatment plants
   h) conditions of wastewater management (physical, operational, institutional, financial, economic, social, environmental aspect, related on-going and planned projects,

policies and legislation)
i) other infrastructure

2. Field survey
a) quality and quantity of wastewater
b) awareness of the citizens on environmental protection and their willingness and affordability to pay
c) quality and quantity of river water

3. Evaluation of present conditions of wastewater management and identification of problems and issues with emphasis on:
a) physical aspects
b) operational aspects
c) legal and institutional aspects
d) financial aspects
e) socio-economic aspects
f) environmental aspects
g) relevant plans

4. Formulation of planning framework, forecasting:
a) population growth and urbanization
b) economic growth and changes in living conditions
c) industrial growth
d) trends in meteo-hydrology
e) changes of quality and quantity of wastewater

5. Establishment of goals and strategies on:
a) sewerage / hygiene facility
b) wastewater treatment method
c) operation and management of organization
e) regulation
f) environment / hygiene education

6. Establishment of basic policies on:
a) quantity of wastewater
b) quality of wastewater, before treatment
c) quality of wastewater, after treatment

7. Formulation of master plan
a) target year, area, population and wastewater quantity
b) preliminary design of facilities
c) operation and management plan
d) cost estimation
e) staging implementation plan

8. Evaluation of master plan, including:
a) technical evaluation
b) financial evaluation
c) economic evaluation
d) social evaluation

e) environmental evaluation

9. Selection of priority project(s):
   a) financial aspects
   b) urgent necessity
   c) hygiene aspects
   d) possible aspects

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 about feasibility study

3. Preliminary design of facilities

4. Equipment plan

5. Construction plan

6. Operation and maintenance and promotion plans on:
   a) guidelines for proper operation
   b) preventive maintenance
   c) rehabilitative maintenance
   d) managerial capability
   e) organizational structure
   f) staffing and manpower development
   g) public education

7. Financial plan
   a) target level of cost recovery
   b) policy on mobilizing financial resources for investment
   c) tariff policy
   d) privatization

8. Cost estimation

9. Implementation plan

10. Conduct of Environmental Impact Assessment(EIA)

11. Comprehensive project evaluation including:
   a) technical aspects(appropriate technology)
   b) legal and institutional aspects
   c) financial aspects
   d) social aspects
   e) economic aspects
   f) 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.

2. Progress Report (1):
   Twenty (20) copies at the end of the first work in Bangladesh.

3. Interim Report:
   Twenty (20) copies at the beginning of the second work in Bangladesh.

4. Progress Report (2):
   Twenty (20) copies at the end of the second work in Bangladesh.

5. Draft Final Report:
   Twenty (20) copies at the beginning of of the third work 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. Dhaka Water Supply and Sewerage Authority 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. Dhaka Water Supply and Sewerage Authority 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 Dhaka
(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.

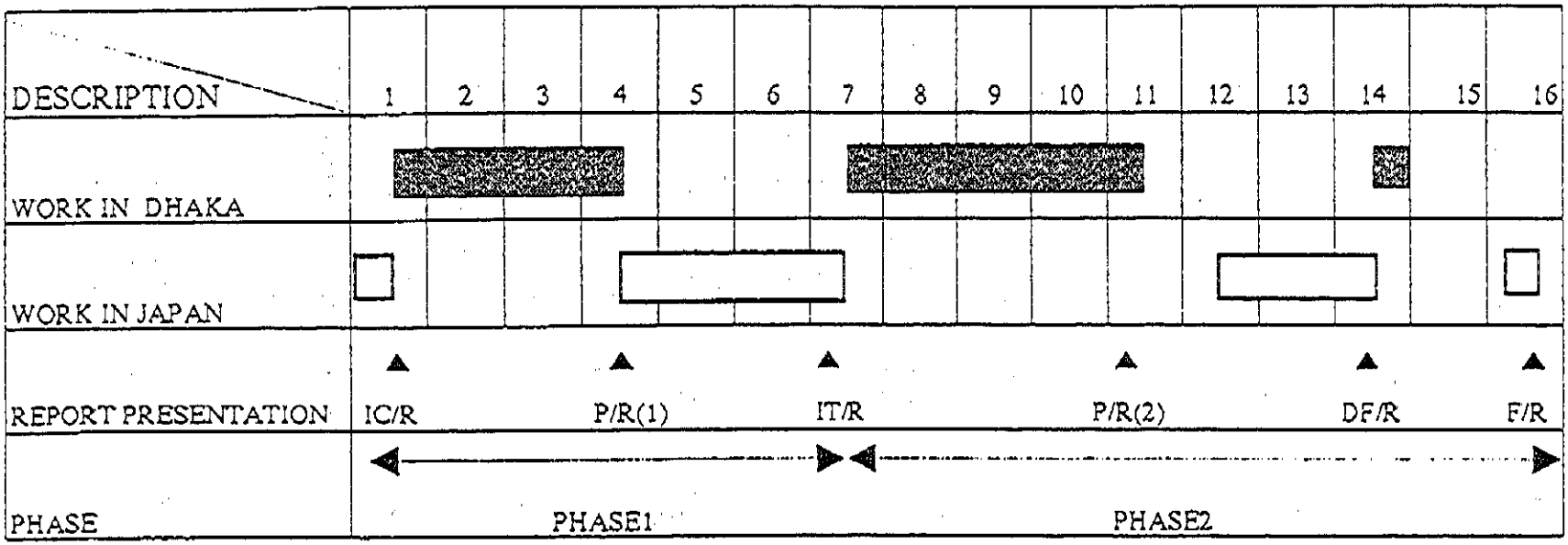
## IX. CONSULTATION

JICA, Dhaka Water Supply amd Sewerage Authority ,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.

ANNEX

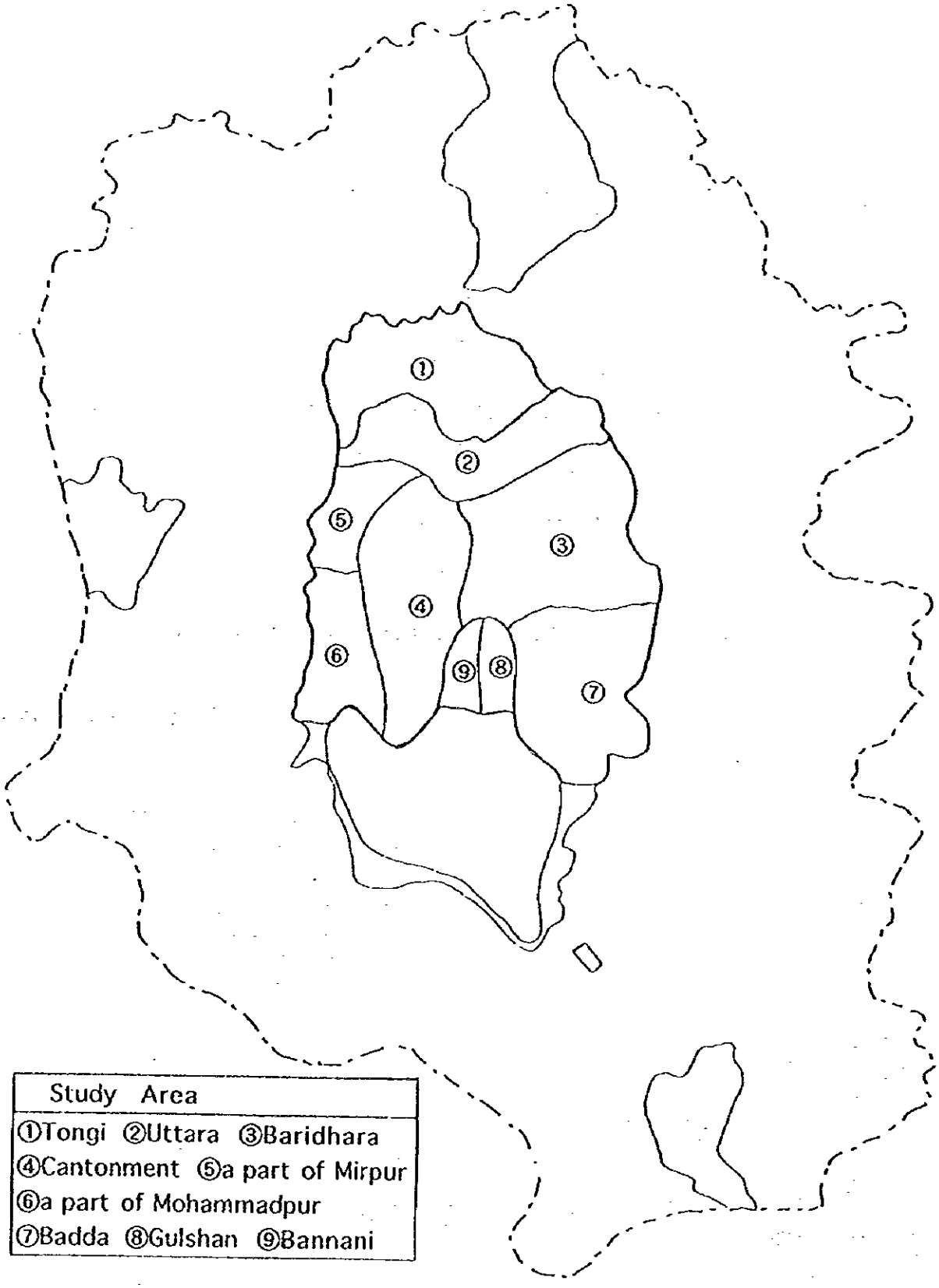
The Study on
Sewerage System in North Dhaka
in the People's Republic of Bangladesh

TENTATIVE SCHEDULE




NOTE
IC/R : Inception Report
P/R : Progress Report
IT/R : Interim Report
DF/R : Draft Final Report
F/R : Final Report

Appendix Study Area




| Study Area |
|---|
| ①Tongi ②Uttara ③Baridhara |
| ④Cantonment ⑤a part of Mirpur |
| ⑥a part of Mohammadpur |
| ⑦Badda ⑧Gulshan ⑨Bannani |

MINUTES OF MEETINGS

FOR

THE MASTER PLAN AND FEASIBILITY STUDY

FOR

THE DEVELOPMENT OF SEWERAGE SYSTEM

IN

NORTH DHAKA

IN

THE PEOPLE'S REPUBLIC OF BANGLADESH

AGREED UPON BETWEEN

THE MINISTRY OF FINANCE

AND

THE JAPAN INTERNATIONAL COOPERATION AGENCY

Dhaka, November 25, 1996

Mr. M. Azizul Islam
Deputy Secretary
Economic Relations Division
Ministry of Finance

Mr. Eijiro TAKASHIMA
Leader
Preparatory Study Team
Japan International Cooperation
Agency

Mr. Serajul Islam
Deputy Chief (Planning)
Ministry of Local Government
Rural Development and Co-operatives

Mr. S. A. Malek
Deputy Chief (Planning)
Dhaka Water Supply and Sewerage Authority

## 1. Introduction

In response to the request of the Government of People's Republic of Bangladesh (hereinafter referred to as "the Government of Bangladesh"), the Preparatory Study Team (hereinafter referred to as "the Team") of the Japan International Cooperation Agency (hereinafter referred to as "JICA") visited Bangladesh from November 15 to December 1, 1996 to discuss the Scope of Work (hereinafter referred to as "S/W") for The Master Plan and Feasibility Study for the Development of Sewerage System in North Dhaka in the People's Republic of Bangladesh (hereinafter referred to as "the Study").

The Team carried out field surveys of the study area and held a series of discussions with the authorities concerned of the Economic Relations Division of Ministry of Finance, Planning Commission, Local Government Division, Dhaka Water Supply and Sewerage Authority (hereinafter referred to as "DWASA") and other organizations.

The list of attendants is shown in the Appendix.

The Minutes of Meetings have been prepared for the better understanding of the S/W agreed upon between the Bangladesh side and the Team on 25 November, 1996, summarizing main points of the discussions made in the course of the preparation of the S/W.

## 2. Definition of "North Dhaka"

North Dhaka for the Study includes Tongi, Uttara, a part of Mirpur and Mohammadpur, Bannani, Gulshan, Badda, Baridhara, Cantonment, and adjoining areas. Savar is excluded from the Study area due to the long distance from other parts of the Study Area.

## 3. Study Title

The Bangladesh side requested that the title of the Study would be " The Master Plan and Feasibility Study for the Development of Sewerage System in North Dhaka in the People's Republic of Bangladesh ", and the Team agreed to it.

## 4. Scope of Study

(1) Study Objectives

Both side agreed that the objectives of the Study are to formulate a Master Plan for improvement of wastewater management in North Dhaka and to conduct a feasibility study on the priority project(s) selected from the master plan as well as to transfer technology on planning methods and skills to counterpart personnel in the course of the Study with following understandings.

a. The focus of the Study shall be, in principle, on domestic wastewater. As for the industrial wastewater, it shall be mutually discussed in the course of the Study.

b. Maximum use of existing facilities and low cost sanitation system shall be taken into consideration to avoid any duplication of investment.

(2) Study Area

Both sides agreed that the Study area shall be North Dhaka. The JICA Study Team, however, make a field reconnaissance in South Dhaka in the course of the Study when necessity arises. In addition, the Bangladesh side is responsible for acquiring the neighboring consensus for smooth implementation of topographic and geological survey and environmental study on the proposed sites for sewerage facilities.

(3) Target Year

The Bangladesh side requested that the target year for the master plan should be changed from 2010 to 2020 since the present water supply plan is targeted up to 2020. The Team understood the situation and agreed to it.

(4) Study Period

Both sides agreed that the Study period shall be tentatively 16 months and that this period is subject to changes in the course of the Study.

(5) Sanitary Education/ People's Participation

The necessity of the sanitary education and the people's participation was well recognized by the Bangladesh side as well as the Team for the sustainable sewerage system.

## 5. Coordination with Other Ministries and Organizations

The Team requested the Bangladesh side to coordinate with other ministries and organizations concerned such as, Planning Commission, DPHE, World Bank(IDA), ADB,UNDP, UNICEF and NGOs to get maximum cooperation from these organizations as well as to avoid any duplication of works. Both sides agreed to establish a steering committee headed by the Secretary of Local Government Division to achieve the above mentioned coordination.

## 6. Undertakings of the Government of Bangladesh

(1) It was confirmed that the Bangladesh side would assign the appropriate number of counterpart personnel to the JICA Study Team totaling approximately 10 and covering the following fields. A good command of English is a preferable qualification for the counterpart personnel for the better communication between the JICA Study Team and counterpart personnel. The number and fields of counterpart personnel will, however, be finalized between the Bangladesh side and the JICA Study Team throughout discussions at the commencement of the Study.

a. Supervision (Sewerage Planning)
b. Sewerage Facility Planning
c. Sewerage Treatment Planning
d. Urban Development Planning
e. Socio-economy/Economy
f. Water Quality and Environment
g. Sanitary Education/Peoples's Participation
h. Institution/Organization
I. Coordination for the JICA Study Team
J. Others

(2) The Team requested that DWASA would provide suitable office space with necessary equipment within DWASA office in Dhaka and sufficient numbers of vehicles with drivers for the Study. DWASA, however, expressed concern that, due to budgetary constraints, such a request could not be fulfilled. The Team recognized the situation and promised to convey the message to JICA H.Q. for consideration.

(3) Regarding VII.1.(6) described in the S/W, DWASA expressed concern that this could be hard to accept since DWASA is not in a position to give permission for the JICA Study Team to enter into private properties or restricted areas. Although the Team recognized the situation, the Team explained that accuracy of the Study could not be secured without grasping the actual condition of wastewater treatment of such facilities located in the Study area. The Team, therefore, requested DWASA to take necessary measures for giving information about the actual condition of wastewater treatment in such facilities so that the JICA Study Team will be in a position to analyze the present condition of the Study area. However, the JICA Study Team will have to request DWASA with the list of information / data, they require for the Study.

(4) Regarding VII.1.(7) described in the S/W, DWASA expressed concern that this could be hard to accept since DWASA is not in a position to give permission for the JICA Study Team to take

photographs and maps of private properties or restricted areas out of Bangladesh to Japan.The Team recognized the situation and promised to convey the message to the JICA H. Q. for consideration.

**7. Counterpart Training**

The Bangladesh side requested that JICA would conduct counterpart training in Japan for officials from concerned agencies, ministries and organizations for the purpose of the smooth transfer of technology during the Study. The Team agreed to convey this request to JICA H.Q. for consideration. The training period, training field and selection of personnel shall be mutually discussed after the Study starts.

**8. Technology Transfer Seminar**

The Bangladesh side requested that JICA would hold a seminar as a part of the technology transfer twice (IT/R and DF/R) in the course of the Study. The Team recognized the necessity and promised to convey the request to JICA H.Q. for positive consideration.

**9. Equipment**

The Bangladesh side requested that JICA would bring necessary equipment for the Study to effectively and efficiently 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.

The Team explained that in case the Bangladesh side wish JICA to provide DWASA with such equipment at the end of the Study, that issue shall be discussed in the course of the Study observing the progress and achieved level of technology transfer. The Team also explained that provision of such equipment would be considered upon official request by the Bangladesh side in the event that technology transfer is considered successful.

**10. Reports**

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

**11.Local Consultant**

The Bangladesh side requested that JICA would hire local consultants to effectively and efficiently conduct the Study in line with TAPP. The Team expressed concern that such request would be hard to accept by explaining the JICA's Development Study Program to the Bangladesh side. The Team, however, promised to convey the request to JICA H.Q. for consideration since Japanese consultant(s) would be in a position to directly make contracts with local consultants.

**12.Other**

The Team explained JICA's Development Study Program and the Bangladesh side fully understood the Program.

APPENDIX

## LIST OF PARTICIPANTS

(Bangladesh side)

Ministry of Finance

| | |
|---|---|
| M. Azizul Islam | Deputy Secretary, Economic Relations Divisions |
| M. Saifullah | Senior Assistant Secretary, Economic Relations Divisions |

Ministry of Planning

| | |
|---|---|
| Sadia Khatun | Assistant Chief, Planning Commission |
| Abbas Ali Miah | Deputy Chief |

Ministry of Local Government Rural Development and Co-operatives

| | |
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| S. M. Golam Ali | Assistant Chief |
| Serujul Islam | Deputy Chief |

Dhaka Water Supply and Sewerage Authority

| | |
|---|---|
| S. A. Malek | Deputy Chief (Planning) |
| Engr Q. G. Mowla | Superintending Engineer |
| M. A. Jalil | Assistant Chief (Planning) |

National Board of Revenue

| | |
|---|---|
| Shahnaj Parveen | Second Secretary |

(Japanese side)

Embassy of Japan

| | |
|---|---|
| Hitoshi SANADA | First Secretary |

Japan International Cooperation Agency Bangladesh Office

| | |
|---|---|
| Morimasa KANAMARU | Resident Representative |
| Yoshio FUKUDA | Deputy Resident Representative |

Preparatory Study Team

| | |
|---|---|
| Eijiro TAKASHIMA | Leader / Sewerage Planning |
| Masato TOGAWA | Cooperation Planning |
| Masahiro CHIBA | Study Planning |
| Eizaburo FURUTANI | Sewerage Facility |
| Toshiharu TAKASUGI | Water Quality / Environment |
| Takio OSHIO | Organization / Management |

添付資料 4

# Questionnaire for The Study on Sewerage System in North Dhaka in the People's Republic of Bangladesh

November, 1996

Preparation Study Team
Japan International Cooperation Agency

0. Urban Planning

| No | Item | Description | Rank | Yes /No | Please indicate where materials are Available | Name of materials |
|---|---|---|---|---|---|---|
| 0.1 | Urban Planning for Dhaka | (1) Planner (UNDP,WB,ADB)<br>(2) Area<br>(3) Year | A A | | | |
| 0.2 | Urban Development Regulation | (1) Authority<br>(2) Content | A A | | | |



Meaning of Rank

AA: Most Important (need quick response before the Study Team leaves Japan)
A: Very Important (need quick response before the Study Team leaves Japan)
B: Important (need response when the Study Team arrives in Dhaka)
C: Important (need response before the Study Team leaves Dhaka)

1. General Information

| No | Item | Description | Rank | Yes /No | Please indicate where materials are Available | Name of materials |
|---|---|---|---|---|---|---|
| 1.1 | Socio-Economic | | | | | |
| 1.1.1 | Latest Socio-economic indices | (1) GNP and GDP | C | | | |
| | | (2) Population | A | A | | |
| | | Present Population | | | | |
| | | Future Population | | | | |
| | | Study Area Population | | | | |
| | | (3) Past and future population growth rate in Dhaka | A | A | | |
| | | (4) Industrial,agricultural and mining products (by main sort) | B | | | |
| | | (5) Foreign trade (quantity and value) | C | | | |
| | | (6) Others | C | | | |
| 1.1.2 | Existing development plans and reports in Dhaka | (1) Economic development plans | B | | | |
| | | (2) Transportation development plan | B | | | |
| | | (3) Industrial development plan | B | | | |
| | | (4) Mining and agricultural development plan | B | | | |
| 1.1.3 | Existing and on-going Water Supply development plans in Dhaka | (1) Design, implementation schedule and current project status | A | A | | |
| 1.2 | Maps to be used for field survey | | A | | | |

| No | Item | Description | Rank | Yes /No | Please indicate where materials are Available | Name of materials |
|---|---|---|---|---|---|---|
| | | Scale:1/5000 ~ 1/10000 | | | | |
| | | (1) Topographic maps, covering the study area | A | | | |
| | | (2) Aerial photo | A | | | |
| | | (3) Land plans and maps | A | | | |
| 1.3 | Geological data | | A | | | |
| | | (1) Geological maps, covering the study area | A | | | |
| | | (2) Existing report about such data / information as: result of geological/ soil investigation | A | | | |
| 1.4 | Meteorological data | | B | | | |
| | | (1) Monthly rainfall data | | | | |
| | | (2) Temperature | | | | |
| | | (3) Stream-flow records | | | | |
| | | (4) Others | | | | |
| 1.5 | Seismological data | | C | | | |
| | | (1) Earthquake records | | | | |

2. Environmental Data

| No | Item | Description | Rank | Yes /No | Please indicate where materials are Available | Name of materials |
|---|---|---|---|---|---|---|
| 2.1 | Law/Regulation/Guideline | List of law/regulations/guideline<br>- Name - Effective year | B | | | |
| 2.1.1 | Fundamental environmental law | DWASA Establishment Law | B | | | |
| 2.1.2 | Environmental Impact Assessment (EIA) and Initial Environmental Examination (IEE) | | B | | | |
| 2.1.3 | Water pollution prevention | | B | | | |
| 2.1.4 | Grand water pollution protection | | B | | | |
| 2.1.5 | Air Pollution Prevention | | B | | | |
| 2.1.6 | Noise and Vibration Prevention | | B | | | |
| 2.1.7 | Offensive odor Prevention | | B | | | |
| 2.1.8 | Solid Waste Control | | B | | | |
| 2.1.9 | Safety and Control for Liquid Chlorine | | B | | | |
| 2.1.10 | Regulation for Effluent | (1)Effluent Water<br>(2)Solid Waste<br>(3)Emission Gas<br>(4)Prevention of noise/vibration<br>(5)Offensive Odor | B | | | |
| 2.1.11 | Effluent limitation | (1) Waste water<br>(2) Soil waste<br>(3) Exhausted gas | B | | | |

| No | Item | Description | Rank | Yes /No | Please indicate where materials are Available | Name of materials |
|---|---|---|---|---|---|---|
| 2.1.12 | Law/Rule concerning Dhaka | | B | | | |
| 2.1.13 | Sewerage Control Law | | B | | | |
| 2.1.14 | Sewerage Tariff Law | | B | | | |
| 2.2 | Authority/Organization | Organization structure Chart | B | | | |
| 2.2.1 | National level responsible authority | Environmental Protection Procedure | B | | | |
| 2.2.2 | Authority in charge of environmental protection | | B | | | |
| 2.2.3 | Local level responsible authority for environmental protection | | B | | | |
| 2.2.4 | Analysis laboratory | Capability and Availability<br>(1)Water<br>(2)Solid | B | | | |
| 2.2.5 | NGO regarding environmental protection | | B | | | |
| 2.2.6 | Monitoring for environmental condition | | B | | | |
| 2.3 | Present Environmental Condition regarding Study Area in latest few years | Min,Max,Average and Regulation standard value | B | | | |

| No | Item | Description | Rank | Yes /No | Please indicate where materials are Available | Name of materials |
|---|---|---|---|---|---|---|
| 2.3.1 | Grand water quality | | B | | | |
| 2.3.2 | Surface water quality | | B | | | |
| 2.3.3 | Air Quality | | B | | | |
| 2.3.4 | Noise and Vibration | | B | | | |
| 2.3.5 | Offensive Odor | | B | | | |
| 2.4 | International Conventions on environmental conservation | | B | | | |
| 2.4.1 | Affiliation to bilateral conventions | | B | | | |
| 2.4.2 | Affiliation to multilateral conventions | | B | | | |
| 2.5 | EIA/IEE by another countries and/or agents | List of studies /projects<br>- Name of studies / project<br>- Name of donors | B | | | |
| 2.5.1 | Proposed study / project | - Components of study / project | B | | | |
| 2.5.2 | On-going study / project | - Implementation year of study/ project and EIA/IEE | B | | | |
| 2.5.3 | Complete study / project | - Applied Guideline Committee or Agency | B | | | |

| No | Item | Description | Rank | Yes /No | Please indicate where materials are Available | Name of materials |
|---|---|---|---|---|---|---|
| 2.6 | Assistance by another countries / agents | List of studies /projects<br>- Name of studies / project<br>- Name of donors | B | | | |
| 2.6.1 | Proposed study / project | - Components of study / project | B | | | |
| 2.6.2 | On-going study / project | - Implementation year<br>- Grant or loan | B | | | |
| 2.6.3 | Complete study / project | | B | | | |

3 Water Supply

| No | Item | Description | Rank | Yes /No | Please indicate where materials are Available | Name of materials |
|---|---|---|---|---|---|---|
| 3.1 | Water Supply Plans | List of plan<br>- Name | A A | | | |
| 3.1.1 | National level plan | - Effective year | B | | | |
| 3.1.2 | Land use plan | | B | | | |
| 3.2 | Water supply organization | Organization structure chart | B | | | |
| 3.2.1 | Authority | | B | | | |
| 3.2.2 | Organization plan | | B | | | |
| 3.2.3 | Budget of organization | | B | | | |
| 3.3 | Water source organization | Organization structure chart | B | | | |
| 3.3.1 | Authority in charge of ground water | | B | | | |
| 3.3.2 | Authority in charge of surface water | | B | | | |
| 3.3.3 | Authority in charge of geological map | | B | | | |
| 3.4 | Water supply system in Dhaka | | A A | | | |
| 3.4.1 | Supplied area | | A A | | | |
| 3.4.2 | Supplied population in Dhaka | | A A | | | |

| No | Item | Description | Rank | Yes /No | Please indicate where materials are Available | Name of materials |
|---|---|---|---|---|---|---|
| 3.4.3 | Quantity of Water Supply | Daily amount per capita for type of water use (kitchen work, wash,bath,toilet,etc.) | A A | | | |
| 3.4.4 | Water Sources | | A A | | | |
| 3.4.5 | General description of water supply facility | General drawings | B | | | |
| 3.4.6 | General description of pipe line networks | General drawings | B | | | |
| 3.4.7 | Financial situation | Dhaka Financial statements in 1995 fiscal year | B | | | |
| 3.4.8 | Drinking water standard | Table of standard | B | | | |
| 3.4.9 | Data of water analysis | Annual data of standard items - Min,Max,Average | B | | | |
| 3.4.10 | Water Tariff | | B | | | |

| No | Item | Description | Rank | Yes /No | Please indicate where materials are Available | Name of materials |
|---|---|---|---|---|---|---|
| 3.5 | Industrial Water Supply | | B | | | |
| 3.5.1 | Quantity of industrial water | | B | | | |
| 3.5.2 | Industrial Water Sources | | B | | | |
| 3.5.3 | Industrial Water Standard | | B | | | |
| 3.5.4 | Data of Industrial Water Analysis | | B | | | |
| 3.5.5 | Industrial Water Pipeline Networks | | B | | | |
| 3.6 | Assistance by another countries / agencies | | A | | | |
| 3.6.1 | Proposed study / project | | A | | | |
| 3.6.2 | On-going study / project | | A | | | |
| 3.6.3 | Complete study / project | | A | | | |
| 3.7 | Borings and test pits for determining subsurface soil and water condition | | B | | | |
| 3.8 | Usage of River Water | | B | | | |

4. Sewerage

| No | Item | Description | Rank | Yes /No | Please indicate where materials are Available | Name of materials |
|---|---|---|---|---|---|---|
| 4.1 | Sewerage Plans | List of Plans -Name | A A | | | |
| 4.1.1 | National level and plan | - Effective year | A A | | | |
| 4.2 | Authorities / Organizations | Organization Structure Chart | B | | | |
| 4.2.1 | National level responsible authority | | B | | | |
| 4.2.2 | Authority in charge of planning | | B | | | |
| 4.2.3 | Authority in charge of budget | | B | | | |
| 4.2.4 | Authority in charge of construction | | B | | | |
| 4.2.5 | Authority in charge of Operation and Maintenance | | B | | | |
| 4.2.6 | Authority in charge of Discharged Water Control | | B | | | |
| 4.2.7 | Authority in charge of Industrial Waste Water Control | | B | | | |
| 4.2.8 | Authority in charge of Accounting | | B | | | |
| 4.2.9 | Authority in charge of Internal Audit | | B | | | |

4. Sewerage

| No | Item | Description | Rank | Yes /No | Please indicate where materials are Available | Name of materials |
|---|---|---|---|---|---|---|
| 4.2.10 | Authority in charge of Asset Control | | B | | | |
| 4.2.11 | Authority in charge of Law Management | | B | | | |
| 4.2.12 | Authority in charge of Law Planning | | B | | | |
| 4.2.12 | Authority in charge of Purchase | | B | | | |
| 4.2.13 | Authority in charge of Personnel Management | | B | | | |
| 4.2.14 | Authority in charge of Salary & Welfare | | B | | | |
| 4.2.15 | Authority in charge of General Affairs | | B | | | |
| 4.2.16 | Authority in charge of Public Relation | | B | | | |
| 4.3 | Sewerage System (Dhaka) | | A A | | | |

| No | Item | Description | Rank | Yes /No | Please indicate where materials are Available | Name of materials |
|---|---|---|---|---|---|---|
| 4.3.1 | Sewered Area | | A A | | | |
| 4.3.2 | Sewered Population | | A A | | | |
| 4.3.3 | General Description of Sewerage Facility | (1)Lift Station<br>(2)Pump Station<br>(3)Sewage Treatment Plant | B | | | |
| 4.3.4 | Pagla Treatment Plant | (1)Extra Land Space<br>(2)Method of Sludge Treatment | B | | | |
| 4.3.5 | General Description of Pipe Line networks | (1)General Drawing of Sewerage facilities<br>(2)Pipe Materials<br>(3)Method of Piping and Construction | B | | | |
| 4.3.6 | Financial situations | (1)Charge System<br>(2)Tariff Collect System<br>(3)Possibility of Charging System in Study Area<br>(4)Revenue Source of Sewerage Construction | B | | | |
| 4.3.7 | Treated Water Standard | Table of Standard | B | | | |
| 4.3.8 | Date of Water Analysis ( Raw water and Treated water ) | Annual data<br>Quality and Quantity<br>-Min, Max, Average | B | | | |

| No | Item | Description | Rank | Yes /No | Please indicate where materials are Available | Name of materials |
|---|---|---|---|---|---|---|
| 4.3.9 | Maintenance of Sewerage | (1)Present condition<br>(2)Authority of maintenance<br>(3)Water flow condition<br>(4)Existing technology<br>(5)Tools (TV camera,Flow indicator)<br>(6)Revenue source | A | | | |
| 4.4 | Assistance by another | | A | | | |
| 4.4.1 | Countries / Agencies | | A | | | |
| 4.4.2 | Proposed Study / Project | | A | | | |
| 4.4.3 | On-going Study / Project | | A | | | |
| 4.4.4 | Complete Study / Project | | A | | | |
| 4.5 | Maps showing existing sewerage/drainage system layout plans | Scale 1:50000, or larger | A | | | |

| No | Item | Description | Rank | Yes /No | Please indicate where materials are Available | Name of materials |
|---|---|---|---|---|---|---|
| 4.6 | Flow gaging and sampling in the existing sewers to establish flow characteristics from similar area | | B | | | |
| 4.7 | Design basis and operational characteristic of the existing sewers from system records | | B | | | |
| 4.8 | Costs of materials, equipment,labors and land acquisition for sewerage system | | B | | | |
| 4.9 | Qualities and quantities of commercial and industrial waste waters produced in the project area | | A | | | |
| 4.10 | Impact of effluent to the public water zone | | A | | | |
| 4.11 | Problems of sewerage in Dhaka | | A | | | |

5. Ground water pollution

| No | Item | Description | Rank | Yes /No | Please indicate where materials are Available | Name of materials |
|---|---|---|---|---|---|---|
| 5.1 | Authority / Organization | Organization Structure Chart | C | | | |
| 5.1.1 | National Level Responsible Authorities | | C | | | |
| 5.2 | Ground Water Pollution Study | List of Study<br>-Name<br>-Executed Year | C | | | |
| 5.3 | Assistance by another Countries / Agencies | | C | | | |
| 5.3.1 | Proposed Study / Project | | C | | | |
| 5.3.2 | On-going Study / Project | | C | | | |
| 5.3.3 | Complete Study / Project | | C | | | |
| 5.4 | Ground water level | | C | | | |
| 5.5 | Ground subsidance | | C | | | |

6. Solid Waste Management

| No | Item | Description | Rank | Yes /No | Please indicate where materials are Available | Name of materials |
|---|---|---|---|---|---|---|
| 6.1 | Authorities / Organization | | B | | | |
| 6.1.1 | National Level responsible Authority | Organization Structure Chart | B | | | |
| 6.1.2 | Local Level Responsible Authority | Organization Structure Chart | B | | | |
| 6.2 | Present Situation of Solid Waste Management | | B | | | |
| 6.2.1 | Present Situation of Solid Waste Discharge | Description of present situation | B | | | |
| 6.2.2 | Present Status of Solid Waste Collection | | B | | | |
| 6.2.4 | Present Status of Solid Waste Treatment | | B | | | |
| 6.2.5 | Present Status of Solid Waste Disposal | | B | | | |
| 6.3 | Present Situation of Counter measure | List of countermeasure<br>-Name of countermeasure<br>-Executed year | B | | | |
| 6.3.1 | Completes Area | | B | | | |
| 6.3.2 | Urgently Required Area | | B | | | |
| 6.4 | Canvass of significant industry to determinate type and amount of wastes | | B | | | |

7. Others

| No | Item | Description | Rank | Yes /No | Please indicate where materials are Available | Name of materials |
|---|---|---|---|---|---|---|
| 7.1 | Industrial Pollution<br>(1) Air Pollution<br>(2) Water Pollution<br>(3) Soil Contamination | | B | | | |
| 7.2 | Toilet system,individual excreta disposal systems | Effluent qualities, sludge collection and disposal methods | B | | | |
| 7.3 | Types of Toilet | (1)Flush toilet<br>(2)Vault toilet<br>(3)Dropping to river | B | | | |
| 7.4 | Public health condition | Water-born disease patients, hospital,health care system | A | | | |
| 7.5 | Local consultant's name and capabilities for sewerage system | | B | | | |
| 7.6 | Power supply condition | | B | | | |
| 7.7 | Preservation | (1)Cultural properties<br>(2)Sightseeing spots<br>(3)Natural resources | B | | | |
| 7.8 | Night soil | (1)Types of night soil treatment<br>(2)Method of night soil treatment<br>(3)Population for types of night soil treatment | B | | | |

5．主な面会者

大蔵省（ＥＲＤ）

M.Azizul Islam　Duputy Secretary, Economic Relations Divisions
M.Saifullah　Senior Assistant Secretary, Economic Relations Divisions

地方自治体開発省

S.M.Husain　Joint Secretary/Director-General
S.M.Golam Ali　Assistant Chief
Serujul Islam　Deputy Chief

ダッカ上下水道公社（ＤＷＡＳＡ）

K.Azharul Haq　Managing Director
Engr.Abdul Muquee　Deputy Managing Director
S.A.Malek　Deputy Chief
Engr Q.G.Mowl　Superintending Engineer
M.A.jalil　Assistant Chief
M.A.Manna　Executive Engineer
Q.Alam Chowdhury　Project Director
M Nurul Huda Mian　Commercial Manager
C.A.M.Khairul Kbir Khan Tathan　Quality Control & Research Department
Mahbule Hossain Khern　Law Officer
Naim Uddin Ahmed　Department of Envirnment
M.M.Hajizur Rahman
Ahmed Farouq
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A.M.Kheiml Kabin Khan Pahman

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A.Rahim Bhuiy　Joint Chief
Sadia Khatu　Assistant Chief,Planning Commission

国家歳入委員会

Shahnaj Parveen　Second Secretary

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ＲＡＪＵＫ

Shaukot Ali Khan　Chief Town Planner

ＵＮＩＣＥＦ（Water & Environmental Sanitation)

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ＤＰＨＥ　(Department of Public Health Engineering)

S.A.K.M Shafigue　Additional Chief Engineer
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世界銀行

Arun Banerjee　Chief (Energy and Infrastructure Unit)
Zahed H.Khan　Program Officer (Urban)

会計士協会

A.H.Siddiqui　President, a member of DWASA board

在バングラデシュ大使館

金子　義和　大使
高橋　周平　公使
真田　仁　一等書記官

国際協力事業団バングラデシュ事務所

| | |
|---|---|
| 金丸　守正 | 事務所長 |
| 福田　義夫 | 担当所員 |

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| 専門分野 | 会社／組織名 | 住所 | 電話・FAX |
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| | BangladeshUniversity, Engineering Technology | | |
| | Bangladesh Atomic Energy Center | | |
| | Bangladesh Center for Saniti ficate and Industrial Reseach | | |
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## 7．収集資料リスト

| NO | 資 料 名 | 発行元、入手先 | 使用言語 |
|---|---|---|---|
| 1 | The Environment Protection Act, 1995 | Dept. of Environment | English |
| 2 | Environmental Quality Standard, July 1991 (PROPOSED) | D O E | English |
| 3 | Industrial Guideline | | Bengali |
| 4 | Monitoring for Water (1993 July - 1994 June) | D O E | English |
| 5 | Environment Policy (1992) | D O E | Bengali |
| 6 | The Sewage Disposal System of Dhaka City | DWASA | English |
| 7 | JOY DICTIONARY (Bengali to English) | Joy Books Int' l | Bengali/English |
| 8 | DHAKA CITY GUIDE MAP | PARVES STATIONERY MART | English |
| 9 | DHAKA CITY GUIDE MAP | THE MAPPA | English |
| 10 | 1994 Statistical Yearbook of Bangladesh | Bureau of Statistics | English |
| 11 | Bangladesh Economic Review 1996 | Ministry of Finance | English |
| 12 | Statistical Pocketbook - Bangladesh 95 | Bureau of Statistics | English |
| 13 | The East Pakistao Water Supply and Sewerage Authority Ordinance, 1963 | DWASA | English |
| 14 | THE DACCA WATER SUPPLY & SEWERAGE AUTHORITY RULES, 1966 | DWASA | English |
| 15 | REPORT OF THE MARTIAL LAW COMMITTEE ON ORGANIZATIONAL SET-UP | DWASA | English |
| 16 | Explanation letter of DAKKA population | Bureau of Statistics | Bengali/English |
| 17 | Report and Statement of Accounts - June 1995 | DWASA | English |
| 18 | Draft reports under Consultancy Services for Development of Stores / Inventory Manegement System | S. F. AHMED & CO | English |
| 19 | Staff appraisal report -Bangladesh Fourth Dhaka Water Supply Project | The World Bank | English |
| 20 | DHAKA STRUCTURE PLAN - Sep 1995 | United Nations Development Programme | English |
| 21 | URBAN AREA PLAN 1995-2005 draft | United Nations Development Programme | English |
| 22 | D CITY Emergency Water Supply Project Feasibility study - volume 1, 2, 3 | United Nations Development Programme | English |

| | | | |
|---|---|---|---|
| 23 | BANGLADESH URBAN SECTOR STRATEGY STUDY | ASIAN DEVELOPMENT BANK | English |
| 24 | ANNUAL BUDGET (budget speech) | Ministry of Finance | English |
| 25 | MANAGEMENT INFORMATION REPORT (SEP. 1996) | DHAKA WASA | English |
| 26 | LEGAL SYSTEM OF BANGLADESH | HUMANIST AND ETHICAL OF BANGLADESH | English |

## 9．下水道法抄訳

ダッカ上下水道公社ルール、１９６６

第１条　通称と開始

ダッカ上下水道公社とする。

東パキスタン上下水道公社法（１９６３年）にもとずく地域に適用する。即時適用する。

第２条　定義

主任技術師

所有　　－－　土地

建物

毎年評価

第３条　連結申請

建物所有者は申請して下水道を連結できる。

第４条　事前調査

申請にもとずき調査し、連結費用を請求できる。

第５条　連結費用

規程表にもとずき連結費用が請求される。

第６条　下水道料金

上水道料金に比例して徴収する。

建物の毎年評価にもとずき徴収する（　別表１　）

上記以外の地域では別の徴収をする。

化学廃水については別途料金徴収する。

第７条　料金支払い

請求書にもとずき支払いをする。１０％割引適用もある。

第８条　清掃費用

私有地の下水道清掃は別途料金請求できる。

第９条　給水連結切断

無断で下水道を連結した者にたいしては７日の通告後、給水を切断する。

下水道料金の滞納者に対しても給水連結を切断する。

第１０条　再連結

実費負担で給水の再連結ができる。

第１１条　追加条項

公社決定で追加できる。

第１２条　滞納料金の徴収

公告をもって徴収できる。

物納手段も行使できる。

地方政府が徴収を代行できる。

第１３条　保障預託

連結前に連結保障預託金を徴収できる。

第１４条　所有権の移転できる。

建物土地の譲渡は３か月以内に通知すれば上下水道利用権利移転できる。

第１５条　相続移転

相続による建物土地の譲渡についても上記と同様とする。