

- FAP-9A:      Secondary Town Protection Project  
It is a study project with aid from ADB for the preparation of district and medium sized towns that are prone to erosion and inundation.
- FAP-9B:      Meghna Left Bank Protection Project  
This is an on-going IDA financed Meghna Study Project of BWDB for protection of the left bank of Meghna from Bhairab Bazar to Chandpur.
- FAP-10:      Flood Forecasting and Early Warning Project  
It is an on-going multi-donor project to strengthen BWDB's flood forecasting and early warning system by improving telemetry, radar coverage, radio links, data management and flood modelling with aid from UNDP and Japan.
- FAP-11:      Disaster Preparedness Program  
It is a project with aid from UNDP for establishment of an office of emergency preparedness, to produce flood preparedness manuals at national, district and ulazila levels and to train officials and community leaders in emergency procedures.

#### FAP Supporting Activities

- FAP-12:      FCD/I Agricultural Review  
It is a project with aid from U.K. and Japan for review of performance of existing FCD/I projects especially their agricultural, economic, social and environmental impacts with the aim of providing guidelines on economic and social analysis for regional and feasibility studies.
- The Final Report was submitted in February, 1992. The study provides the agricultural, economic, social and environmental impacts of the existing 17 FCD/I projects, including the Kurigram South FCD project.
- FAP-13:      Operation & Maintenance Study  
It is a project under aid from U.K. and Japan for identification of constraints for O&M of the existing FCD/I projects in order to recommend O&M procedures with participation of beneficiary.
- The Final Report was submitted in March, 1992. The O&M performance and problems are assessed in 17 completed FCD/I projects including the Kurigram South FCD project.
- FAP-14:      Flood Response Study  
It is a project with aid from USA for assessment of response to floods of household in the flood plains and provide guidelines for use in the FAP Projects.
- FAP-15:      Land Acquisition and Resettlement Project  
It is a study project with aid from Sweden for assessment of social impact of land acquisition process to recommend improved procedures and resettlement and develop guidelines for regional and feasibility studies.
- The study started in February, 1991, and the Kurigram South Project area (Upazila Rajarhat) was surveyed as one of the study areas.

- FAP-16:     Environmental Study  
It is a study project under aid from USA for assessment of environmental impact of FAP Projects, development of criteria and Environmental Impact Assessment (EIA) techniques for use in regional studies and project preparation and establishment of an EIA's unit for necessary assessment.
- FAP-17:     Fisheries Study and Pilot Project  
It is a study and pilot project for assessment of FAP on flood plain fisheries and fishing communities, identification of ways for minimizing negative impacts, developing the fisheries resources and producing guidelines for planning FAP Projects.
- FAP-18:     Topographic Mapping  
It is a project under aid from Switzerland, Finland and France for providing aerial photographs, satellite imageries and topographic mapping.
- FAP-19:     Geographical Information System  
It is a project under aid from USA to develop a system for obtaining storing, manipulating, retrieving and displaying geographically based information for management of the FAP activities.
- FAP-20:     Compartmentalization Pilot Project  
It is a project under aid from Netherlands and Germany to develop and test methods of flood control and drainage with participation of beneficiary groups in protected areas in order to provide criteria and guidelines for management of FAP Projects.
- FAP-21/22:   Bank Protection and AFPM Pilot Project  
These are projects under aid from Germany and France with major programs to develop appropriate river training including possible AFPM activities such as reclamation.
- FAP-23:     Flood Proofing Pilot Project  
It is a study project under aid from USA to identify and test effective measures to mitigate adverse effects of flooding especially in unprotected areas and recommend measures of proofing against floods.
- FAP-24:     River Survey Program  
It is a project under aid from EEC to carry out river surveys, collect hydrological and morphological data needed for planning and implementation of FAP projects and undertake special studies on river behavior.
- FAP-25:     Flood Modelling and Management Project  
It is a project under aid from Denmark, France, Netherlands and U.K. to advise, assess and coordinate all activities involving simulation modelling with the objective of consistency with the SWSMO/MPO program funded by DANIDA.
- FAP-26:     Institutional Development Programme  
It is a project under aid from UNDP and France to establish institutional requirements of the FAP, assess existing concerned institutions and undertake special institutional activities to implement the recommendations under FAP. The Project has not been started yet, as of January, 1992.

### Special Economic Study

The study after reviewing the main limitations of the conventional approaches to economic analysis of FCD/I projects, focussed on two main areas.

- (1) the preparation of guidelines on methods of economic analysis to be used in regional planning and feasibility studies under the FAP
- (2) identification of research topics on the likely macro-economic and secondary effects of a major flood control and drainage programme.

### Guiding Principles for FAP

1. Phased Implementation of a Comprehensive Flood Plan aimed at:
  - (1) protection of urban, rural, commercial industrial and public utility centers and communication networks,
  - (2) controlled flooding, wherever possible and appropriate to meet the needs of agriculture, fisheries, navigation, urban flushing soil productivity and recharging the surface water/ground water resources with minimum dislocation of environment.
2. Effective land and water management of protected and unprotected areas, involving compartmentalisation, drainage, irrigation, drainage decongestion, land use, cropping patterns, environment, ecology, erosion/sedimentation control, etc.
3. Strengthening and equipping the disaster management machinery including building infrastructure for quick and effective communication and transmission during disasters.
4. Improvement of the flood forecasting system and establishment of a reliable and comprehensive flood warning system with adequate lead times and at same time evolving techniques for dissemination.
5. Safe conveyance of the large cross-boundary flow to the Bay of Bengal by channeling it through the major rivers with the help of embankments on both sides.
6. Effective river training works for the protection of embankments, infrastructures and population centers, linked wherever possible with the reclamation of land in the active river flood plain, instrument to accommodate necessary engineering measures and allocate space for habitation patterns, economic activities and environmental assets.
7. Reduction of distribution of load on the main rivers through diversion of flows into major distributions or interception of local run-off/local rivers channeling through major tributaries or special diversions.
8. Improvement of the conveyance capacity of the river network to ensure efficient drainage through appropriate channel improvements and ancillary structures to provide regulation and conservation.

9. Development of flood plain zoning as a flexible instrument to accommodate necessary engineering measures and allocate space for habitation patterns, economic activities and environmental assets.
10. Coordinated planning and construction of all rural roads, highway embankments with provision for unimpeded drainage.
11. Encouraging maximum possible popular participation by beneficiaries in the planning, implementation, operation and maintenance of flood protection infrastructure and facilities.

KURIGRAM IRRIGATION AND FLOOD CONTROL PROJECT (SOUTH UNIT)  
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SCOPE OF WORK  
FOR  
THE FEASIBILITY STUDY  
ON  
THE KURIGRAM IRRIGATION AND FLOOD CONTROL  
PROJECT - SOUTH UNIT  
IN

THE PEOPLE'S REPUBLIC OF BANGLADESH

AGREED UPON BETWEEN

BANGLADESH WATER DEVELOPMENT BOARD

AND

JAPAN INTERNATIONAL COOPERATION AGENCY

Dhaka, Bangladesh

August 20, 1991

signed

LIAQUAT HOSSAIN

Chief Engineer (Planning)  
Bangladesh Water Development  
Board (BWDB)  
Ministry of Irrigation, Water  
Development and Flood Control

signed

TOSHIO MORIYASU

Leader of the Preliminary  
Survey Team  
Japan International  
Cooperation Agency (JICA)

## I. INTRODUCTION

In response to the request to the Government of the People's Republic of Bangladesh (hereinafter referred to as "the Government of Bangladesh"), the Government of Japan has decided to conduct a Feasibility Study on the Kurigram Irrigation and Flood Control Project - South Unit (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 programmes 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. OBJECTIVE OF THE STUDY

The objective of the study are

1. To formulate the irrigation and drainage development and flood control plan in Kurigram South Unit for the increase and improvement of agricultural production.
2. To undertake transfer of technology to the Bangladesh governmental personnel concerned in the course of the study.

## III. STUDY AREA

The study area covers about 63,000 ha (155,300 acres) located inside the embankment already constructed in Kurigram South Unit and the adjoining area relevant to the project.

## IV. SCOPE OF THE STUDY

The Study consists of two phases, Data collection, field survey and review of existing Feasibility Study will be conducted in phase I and detailed survey will be carried out in phase II for the completion of the Study.

### 1. Phase I

#### I-1 Data collection and field survey

To collect and review available data and information relevant to the Study and to carry out field survey on the following items;

#### (1) Natural Conditions

- a. Topography
- b. Meteorology
- c. Hydrology
- d. Geology
- e. Soil
- f. Water quality
- g. Groundwater
- h. Sedimentation and erosion

(2) Social conditions

- a. Population and habitation
- b. Social organization
- c. Economy
- d. Employment
- e. Social infrastructure
- f. Transportation

(3) Agricultural conditions

- a. Agricultural production (yield)
- b. Farming and farmer's economy
- c. Land use
- d. Land holding and tenure system
- e. Cropping pattern
- f. Farmer's organization
- g. Marketing and other supporting service
- h. Agro-industry
- i. Inland fisheries

(4) Agricultural infrastructure

- a. Irrigation and drainage systems  
(including drainage channels and regulators already constructed in the study area)
- b. Flood control system  
(including flood embankment already constructed in the study area)
- c. Farm road
- d. Construction materials and their prices

(5) Existing F/S reports on the Kurigram South Unit

(6) Others

1-2 Establishment of basic concept for the project

- a. Delineation of the project area
- b. Outline of the agricultural development plan to be proposed
- c. Basic plan of major Agricultural infrastructures
- d. Strategy for the plan formulation

2. Phase II

On the basis of the result of Phase I, the following items will be studied in Phase II.

2-1 Topography survey of the area where major infrastructure will be constructed.

2-2 Supplementary survey and additional data collection

2-3 Formulation of the irrigation and drainage development and flood control plan in the Kurigram South Unit area

- a. Final delineation of the project and beneficiary areas
- b. Land use plan
- c. Cropping pattern and farming
- d. Irrigation, drainage and flood control systems
- e. Preliminary design of major Agricultural infrastructures
- f. Marketing and other supporting service
- g. Implementation plan and schedule
- h. Cost and benefit estimate
- i. Socio-economic evaluation
- j. Operation and maintenance plan

V. STUDY SCHEDULE

The Study will be executed in accordance with the attached tentative schedule within 18 (eighteen) months.

VI. REPORTS

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

1. Inception Report  
Twenty (20) copies within one month after commencement of the Study. The Government of Bangladesh will provide JICA with its comments within fifteen (15) days after receipt of the Inception Report.
2. Progress Report (I)  
Twenty (20) copies at the end of the phase I field work.
3. Interim Report  
Twenty (20) copies at the commencement of the phase II study. The Government of Bangladesh will provide JICA with its comments within thirty (30) days after receipt of the Interim Report.
4. Progress Report (II)  
Twenty (20) copies at the phase II field work.
5. Draft and Final Report  
Twenty Five (25) copies within one month after end of the phase II home office work in Japan. The Government of Bangladesh will provide JICA with its comments within one month after receipt of the Draft Final Report.
6. Final Report  
Fifty (50) copies within two months after receipt of the comments on the Draft Final Report.



VII. UNDERTAKING OF THE GOVERNMENT OF BANGLADESH

1. To facilitate smooth conduct of the Study, the Government of Bangladesh shall take following necessary measures:
  - a. To secured the safety of the Japanese consultants team (hereinafter referred to as "the Team") for the study period.
  - b. To permit the members of the Team to enter, leave and stay in Bangladesh for the duration of their assignment therein, and exempt them from alien registration requirements and consular fees.
  - c. To exempt the members of the Team from taxes, duties and any other charges on equipment, machinery and other materials brought under Japanese technical assistance grant into and out of Bangladesh for the conduct of the study.
  - d. To exempt the members of the Team from income tax and other 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.
  - e. To provide necessary facilities to the Team for remittance as well as utilization of the funds introduced into Bangladesh from Japan in connection with the implementation of the Study.
  - f. To secure permission for entry into private properties or restricted areas for the conduct of the Study.
  - g. 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.
  - h. To provide medical services as needed.  
Its expenses will be chargeable on 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 arises from gross negligence or wilful misconduct on the part of the members of the Team.
3. Bangladesh Water Development Board (herein referred to as "BWDB") shall act as counterpart agency to the Team and coordinating body in relation with other government and non-governmental organizations concerned for the smooth implementation of the Study.
4. BWDB shall, as its own expense, provide the Team with the following in cooperation with other organizations concerned :
  - a. Available data information related to the Study.
  - b. Counterpart personnel.
  - c. Suitable office spaces with necessary equipment in Dhaka and the study area.
  - d. Credentials for the members of the Team.

#### VIII. UNDERTAKING OF JICA

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

- a. To dispatch, at its own expense, the Team to Bangladesh.
- b. To pursue technology transfer to the Bangladesh counterpart personnel in the course of the Study in Bangladesh as well as in Japan.

#### IX. CONSULTATION

BWDB and JICA shall consult with each other in respect of any matter that may arise from or in connection with the Study.

Tentative Schedule

Month in Order	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
Phase	←			Phase I				←		Phase II				→				
Field Work in Banbladsh		▨				▨				▨						▨		
Home Office Work in Japan					□			□						□				
Reports							△	△	△	△		△			△		○	△
							IC/R	P/R (I)	IT/R		P/R (II)				DF/R		Comments	F/R

(Note) IC/R : Inception Report  
 P/R (I) : Progress Report (I)  
 IT/R : Interim Report  
 P/R (II) : Progress Report (II)  
 DF/R : Draft Final Report  
 F/R : Final Report

MINUTES OF MEETING  
ON  
THE KURIGRAM IRRIGATION AND FLOOD  
CONTROL PROJECT SOUTH-UNIT

HELD ON 19-20th AUGUST - 1991  
BETWEEN  
BANGLADESH WATER DEVELOPMENT BOARD (BWDB)  
AND  
JAPAN INTERNATIONAL CO-OPERATION AGENCY (JICA)

Dhaka, Bangladesh  
August 20, 1991

\_\_\_\_\_  
signed  
(M. A. RAZZAQUE)  
Member (Planning)  
Bangladesh Water  
Development Board,  
Ministry of Irrigation,  
Water Development &  
Flood Control,  
Government of the People's  
Republic of Bangladesh

\_\_\_\_\_  
signed  
(TOSHIO MORIYASU)  
Leader  
Project Preliminary  
Survey Team,  
Japan International  
Co-operation Agency  
(JICA)

- 1.0 The meeting on the 'Scope of Work' (S/W) Kurigram Irrigation and Flood Control Project-South Unit was held on 20th August 1991 between BWDB and JICA preliminary survey team to discuss & finalize it.
- 2.0 The List of participants is enclosed as Appendix-I
- 3.0 'Scope of Works' submitted by the JICA was discussed in detail, whereupon both parties have agreed upon it in principle, with the following decision/adjustments.
- 3.1 BWDB Counter Part  
 BWDB confirmed that appropriate number Counterparts persons would be assigned for the study as follows :-
- i. Director, Planning (General), BWDB : Team Leader at Dhaka (Part Time)
  - ii. Superintending Engineer, Teesta Project canal Circle-II: Team Leader at Rangpur (Part Time)
  - iii. Executive Engineer DPG, Dhaka (Part Time)
  - iv. Asst. Engineer, DPG, Dhaka (Full Time)
  - v. Mr. Fakrul Islam, Deputy Chief Agronomist, DPG, BWDB, Dhaka (Part Time)
  - vi. Mr. Minarul Islam, Soil Survey officer, DPG, BWDB, Dhaka (Part Time)
  - vii. Mr. Mohendra Chandra Dey, Economist, Economic, Planning, BWDB, Dhaka (Part Time).
- 3.2 Office Space (Dhaka) & Vehicle :  
 Due to restriction of GOB budget BWDB requested JICA to arrange vehicles with fuel & driver and office accommodation with necessary furniture at Dhaka within the project cost, while BWDB will provide these free of cost at project site (Rangpur/Kurigram).
- 3.3 Data Cost :  
 Data, aerial photo, spot image etc. which will require payment may be procured accordingly on project cost.
- 3.4 Soil, Agro, Socio-Economic Survey :  
 BWDB informed that data available on soil and agro-socio-economic issues are not adequate, So, it will be necessary to carry out field survey on these within the project cost.
- 3.5 Permission to take away Data :  
 Data, documents, Photographs and maps related to study can be taken out of Bangladesh to Japan with written permission and as per prescribed condition of the Govt. of Bangladesh. JICA requested BWDB to make necessary arrangements for the permission as soon as possible after receipt of list from the Study Team.
- 3.6 Environmental Impact Assessment (EIA) :  
 BWDB suggested that Planning of Flood Control, Irrigation and Drainage will have to be environmentally non-detrimental, and also economically cost effective. The environmental issues related to agricultural development project as outlined by the Department of Environment (DOE) & FAP-16 : Environment Study (FPCO) will have to be addressed.
- 3.7 Interaction with On-going Projects :  
 BWDB requested that assessment of effect of fishery should be made linkage will have to be made with no-going IDA funded Third Fisheries Project. Besides interaction will have to be made with FAP-2 : North-West Regional Study, Surface Water Simulation Modelling project (SWSMP/MPO) and related development projects in the area.
- 3.8 Consultation  
 The Chief Engineer, Planning will act as authorized officer on behalf of BWDB who will coordinate the Study.

Appendix - I

LIST OF PARTICIPANTS IN DISCUSSION MEETING  
ON SCOPE OF WORKS ON KURIGRAM IRRIGATION  
AND FLOOD CONTROL PROJECT - SOUTH UNIT

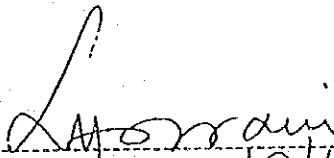
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TIME:10-00

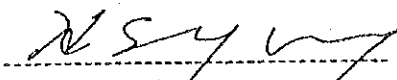
VENUE:CHAIRMAN, BWDB'S CONFERENCE ROOM.

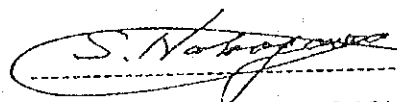
SL.	NAME	DESIGNATION	SIGNATURE
a.	<u>Bangladesh Water Development Board (BWDB)</u>		
1.	M. A. Razzaque	Member, Planning	
2.	Liaquat Hossain	Chief Engineer, Planning	
3.	M. S. Miyan	Director, Finance	
4.	Mr. Enam H. Khan	Director, Land & Water Use	
5.	S. A. M. Rafiquzzaman	Director, Planning (General)	
6.	M. A. Sattar	Deputy Director, Law	
7.	B. U. Talukder	Deputy Secretary, Planning	
8.	M. Ashraf H. Khan	Deputy Secretary, FA & A	
9.	Md. Aminul Haque	Executive Engr., Negotiation cell	
10.	Md. Yusuf Haroon	Executive Engr., Planning (Gen.)	
b.	<u>JICA &amp; Government of Japan</u>		
1.	Toshio Moriyasu	Managing Director, Land Improvement Engineering Service Centre, Kyushu Regional Agricultural Administration Bureau, Ministry of Agriculture, Forestry & Fisheries (MOAFF).	
2.	Hideaki Sekioka	Deputy Director, Water Use Division, Construction Dept. (MOAFF)	
3.	Akira Ohtsuka	Environment Protection Specialist, Kantoh Regional Agricultural, Administration Bureau (MOAFF).	
4.	Mitsukhiko Oota	Deputy Director, Technical Affairs Division, Agriculture, Forestry, Fisheries, Planning & Survey Department, JICA	

MINUTES OF MEETING  
FOR  
INCEPTION REPORT  
ON  
THE KURIGRAM IRRIGATION AND FLOOD CONTROL PROJECT - SOUTH UNIT

December 19, 1991  
Dhaka, Bangladesh

  
-----  
MR. LIAQUAT HOSSAIN  
19/12/91  
CHIEF ENGINEER (PLANNING)  
BANGLADESH WATER DEVELOPMENT  
BOARD (BWDB)

  
-----  
MR. HIROSHI YAMAMOTO  
LEADER, JICA STUDY TEAM

  
-----  
WITNESS: DR. SHOICHIRO NAKAGAWA  
CHAIRMAN OF JICA ADVISORY COMMITTEE

1. Date and Time: December 19, 1991  
10:00 a.m. - 11:30 a.m.
2. Place: CEP Office of BWDB
3. Attendants: see attached list
4. Summary of Discussions:

The JICA Study Team submitted 20 copies of the Inception Report to BWDB in accordance with the "Scope of Works (S/W) for the Feasibility Study on the Kurigram Irrigation and Flood Control Project - South Unit (hereinafter referred to as "the Study") agreed upon between BWDB and JICA on August 20, 1991. Mr. H. Yamamoto, Leader of the JICA Study Team, explained the report to the attendants at the meeting. After the presentation of Mr. Yamamoto, various discussions were made between BWDB and JICA Study Team. The following were confirmed through the discussions:

- (1) The Inception Report was accepted by BWDB with the following observations:
  - 1) The existing feasibility study prepared by BWDB in 1971 should thoroughly be reviewed by the JICA Study team under Phase-I of the Study along with other available study reports;
  - 2) The O&M studies and environmental impact assessment should be carried out under the Study, in accordance with the guidelines of FAP-12, -13, -16, -25 and System Rehabilitation Project (SRP);
  - 3) The existing FAP-2 studies on flood protection works should be fully utilized for the Study;
  - 4) The field survey and investigation to be made by the local consultant should be finalized after consultation with BWDB; and
  - 5) The questionnaires for agro-economic survey should be finalized in consultation with BWDB.
- (2) BWDB will provide the Study Team with the office space at Rangpur during the field trip as well as the following counterpart personnel for the execution of the Study:
  - 1) Mr. S.A.M. Rafiquzzaman, Director, Planning (general)      Team Leader (at Dhaka)  
- Part Time -
  - 2) Superintending Engineer, Teesta Project Canal Circle-II      Team Leader (at Rangpur)  
- Part Time -

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19/12/91



- |    |  |                                 |
|----|--|---------------------------------|
| 3) | Mr. H.S.M. Faruque,<br>Executive Engineer, DPG | Part Time (Irrigation Engineer) |
| 4) | Mr. Ashraf Ali Khandokar                       | Full Time (Soil Scientist)      |
| 5) | Mr. Fakrul. Islam                              | Part Time (Agronomist)          |
| 6) | Mr. Minarul Islam                              | Part Time (Soil Survey Officer) |
| 7) | Mr. Mohendra Chandra Dey                       | Part Time (Economist)           |
| 8) | Mr. Anwar Hossain                              | Full Time (Civil Engineer)      |

- (3) BWDB was requested to provide the JICA Study Team with a full set of the existing feasibility study report prepared by BWDB in 1971 as well as other available study reports.
- (4) The field reconnaissance will be jointly made by the JICA Study Team and BWDB during the period of December 20 - 25, 1991. Detailed work plan will be discussed with BWDB after the field reconnaissance (in early January, 1992).

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19/12/91

LIST OF ATTENDANTS

Bangladesh Water Development Board (BWDB)

- |      |                      |  |
|------|----------------------|--|
| (1)  | Liaquat Hossain      | Chief Engineer, Planning                                       |
| (2)  | Md. Afazuddin        | Chief Engineer, Design II, BWDB                                |
| (3)  | Emam H. Khan         | Director, Land and Water Use                                   |
| (4)  | S.A.M. Rafiquzzaman  | Director, Planning (general)                                   |
| (5)  | H.S.M. Faruque       | Executive Engineer, Planning (general)                         |
| (6)  | M.C. Dey             | Economist, E.P. Directorate, BWDB                              |
| (7)  | Fakhrul Islam        | Dy. Chief Agronomist, Directorate of<br>Planning General, BWDB |
| (8)  | Md. Akhtar Alam      | Executive Engineer, F.P.C.O., Dhaka                            |
| (9)  | Md., Raihan Ali Miah | Executive Engineer, WARPO (MPO), Dhaka                         |
| (10) | Md. Aminul Haque     | Executive Engineer, Negotiation Cell                           |
| (11) | Mukhlesuzzaman       | Executive Engineer, Design V                                   |
| (12) | Md. Moksed Alam      | Senior Technical Design Specialist, LGEB                       |
| (13) | Ashraf Ali Khandker  | Soil Scientist, BWDB   |

Japan International Cooperation Agency (JICA)

- |     |                    |   |
|-----|--------------------|---|
| (1) | Shoichiro Nakagawa | Chairman, JICA Advisory Committee                         |
| (2) | Sizuo Hiroshige    | JICA Headquarter, Tokyo                                   |
| (3) | Haruo Naito        | Deputy Resident Representative,<br>JICA Bangladesh Office |
| (4) | Takeshi Naruse     | Deputy Resident Representative,<br>JICA Bangladesh Office |

JICA Study Team

- |     |              |                                       |
|-----|--------------|---------------------------------------|
| (1) | H. Yamamoto  | Team Leader / Irrigation and drainage |
| (2) | N. Ariga     | Agro-economy / Institutional Planning |
| (3) | Y. Kobayashi | Meteorology and Hydrology             |
| (4) | N. Morioka   | Agriculture / Soil and Land Use       |
| (5) | F. Tamura    | Facility Plan (Headworks)             |
| (6) | Y. Inoue     | Facility Plan (Pumping station)       |
| (7) | K. Tumura    | Topographic Survey                    |

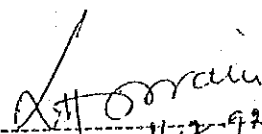
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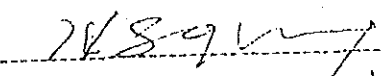
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MINUTES OF MEETING  
FOR  
PROGRESS REPORT NO.1  
OF  
FEASIBILITY STUDY  
ON  
THE KURIGRAM IRRIGATION AND FLOOD CONTROL PROJECT  
- SOUTH UNIT -

March 11, 1992

Dhaka, Bangladesh

  
-----  
11-3-92  
MR. LIAQUAT HOSSEIN  
CHIEF ENGINEER (PLANNING)  
BANGLADESH WATER DEVELOPMENT  
BOARD (BWDB)

  
-----  
MR. HIROSHI YAMAMOTO  
LEADER, JICA STUDY TEAM

1. Date and Time: March 10, 1992, 1:00 p.m. - 3:15 p.m.
2. Place: Conference Room of BWDB
3. Attendants: see attached list
4. Summary of Discussions:

The JICA Study Team submitted 20 copies of the Progress Report No.1 to BWDB on March 3, 1992. The discussion meeting on the Progress Report No.1 was held at the BWDB Conference room on March 10, 1992 at the presence of the concerned officials from other government agencies. The meeting was presided by the Chief Engineer (Planning) of BWDB. At the request from the Chairman, Mr. H. Yamamoto, leader of the JICA Study Team, explained the report to the attendants at the meeting. After the presentation of Mr. Yamamoto, various discussions were made and the following were confirmed through the discussions:

- (1) The Progress Report No.1 was appreciated and accepted by BWDB.
- (2) BWDB agreed to the basic concept that the conjunctive use of both groundwater and surface water resources should be considered for the irrigation development, and requested to the JICA Study Team to include the groundwater expert in the Team under Phase-II.
- (3) The Study Team would examine the following alternatives for irrigation development under the Phase-II, as proposed in the Progress Report:

Alternative-4	:	Tube-well and Barrage
Alternative-6	:	Tube-well and Pumping Plant
Alternative-9	:	Irrigation regulator with LLP and Tube-well

BWDB requested the Study Team to incorporate full details of comparison among the alternatives in the Interim Report. Further possibility of utilizing the existing drainage channel as irrigation canal will be studied under Alternative-9.

- (4) BWDB requested the JICA Study Team to examine the river protection works along the Dharla and Brahmaputra rivers under Phase-II, because FAP-2 would not carry out the required study for the Kurigram south unit at the feasibility level. The Study Team said that the request will be conveyed to the JICA office.

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11-3-92

(5) BWDB pointed out that the priority for implementation should be as follows:

- |              |   |   |
|--------------|---|---|
| Priority - 1 | : | Urgent FC works with drainage improvement |
| Priority - 2 | : | Irrigation development                    |
| Priority - 3 | : | Strengthening of FC works                 |

The Study Team said that the priority for implementation will be reviewed through the field investigation in the monsoon season under the Phase-II and will be fixed up after full discussion with BWDB.

- (6) BWDB emphasized the importance of the socio-economic baseline survey which is scheduled under the Phase-II, and requested the JICA Study Team to carry out a survey in this aspect appropriate for the feasibility level, taking the sample farmers as many as possible in order to obtain the reliable data. The JICA Study Team will carry out a project impact analysis on income distribution among various socio-economic groups, as defined in the Fourth Five Year Plan.
- (7) Soil and land use survey will be continued under Phase-II to upgrade the present soil and land use maps to the feasibility level.
- (8) The JICA Study Team will re-check the availability of latest data and information under Phase-II.
- (9) BWDB suggested that public consultation at all Upazila level should be undertaken under Phase-II to improve the proposed project development plan.
- (10) BWDB pointed out that rural infrastructures such as roads, bridges and growth centers should be studied as one of the possible project components. The Study Team answered that only roads and bridges might be considered as the project component to the extent that land acquisition is minimized, and that other infrastructures would not be included in the project component, though they would be studied.

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11.3.92

LIST OF ATTENDANTS

Bangladesh Water Development Board (BWDB)

(1)	Liaquat Hossain	Chief Engineer, Planning
(2)	Emam H. Khan	Director, Land and Water Use
(3)	S.A.M. Rafiquzzaman	Director, Planning (general), BWDB
(4)	N. A. Gazi	Director, EC. Planning, BWDB
(5)	Syed Shahadat Hossain	Superintending Engineer, Design Circle-7, BWDB
(6)	Y. Haroon	Executive Engineer, Planning (general)
(7)	Md. Akhtar Alam	Executive Engineer, FPCO, Dhaka
(8)	Azizul Haque	Chief Agronomist, WARPO (MPO), Dhaka
(9)	Fakhrul Islam	Dy. Chief Agronomist, Planning General, BWDB
(10)	Md. Moksed Alam	Senior Technical Design Specialist, LGEB
(11)	Ashraf Ali Khandker	Soil Scientist, Planning (General), BWDB
(12)	Md. Minarul Islam	Soil Survey Officer, Planning (General), BWDB
(13)	Md. Sanaullah	SDE., Planning (General), BWDB
(14)	Md. Amzad Hossain	Dy. Director, IMED, M/O Planning
(15)	Md. Ismail	Asst. Director, Department of Fisheries

JICA Study Team

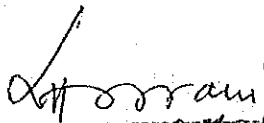
(1)	H. Yamamoto	Team Leader / Irrigation and drainage
(2)	N. Ariga	Agro-economy / Institutional Planning
(3)	Y. Kobayashi	Meteorology and Hydrology
(4)	N. Morioka	Agriculture / Soil and Land Use
(5)	M. Tatebayashi	Soil Mechanics and Foundation
(6)	J. Nakagawa	Facility Plan (Pumping station)
(7)	F. Tamura	Facility Plan (Headworks)
(8)	K. Tsumura	Topographic Survey
(9)	K. B. S. Rasheed	Environmental Assessment
(10)	M. A. L. Sarker	Inland Fishery
(11)	K. Ito	Observer

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11.3.92

MINUTES OF MEETING  
FOR  
INTERIM REPORT  
OF  
FEASIBILITY STUDY  
ON  
THE KURIGRAM IRRIGATION AND FLOOD CONTROL PROJECT  
- SOUTH UNIT -

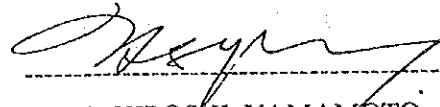
July 28, 1992

Dhaka, Bangladesh

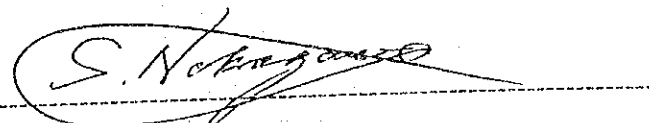


28/7/92

MR. LIAQUAT HOSSAIN  
CHIEF ENGINEER (PLANNING)  
BANGLADESH WATER DEVELOPMENT  
BOARD (BWDB)



MR. HIROSHI YAMAMOTO  
LEADER, JICA STUDY TEAM



WITNESS: DR. SHOICHIRO NAKAGAWA  
CHAIRMAN OF JICA ADVISORY COMMITTEE

1. Date and Time: July 27, 1992, 1:00 p.m. - 3:00 p.m.
2. Place: Conference Room of BWDB
3. Attendants: see attached list
4. Summary of Discussions:

The JICA Study Team submitted 20 copies of the Interim Report to BWDB on July 19, 1992. The discussion meeting on the Interim Report was held at the BWDB Conference room on July 27, 1992, at the presence of the Chairman of the JICA Advisory Committee and the representatives from the concerned agencies. The meeting was presided by Mr. Liaquat Hossain, Chief Engineer, Planning, BWDB. At the request from the Chairman, Mr. H. Yamamoto, leader of the JICA Study Team, explained the outline of the Interim Report to the attendants. After the presentation of Mr. Yamamoto, various discussions were made and the following were confirmed through the discussions:

- (1) The Interim Report is well-focussed, and approaches and recommendations described are agreed with the national water development policies and on-going FAP studies. The Report was therefore appreciated and accepted by BWDB.
- (2) BWDB agreed to the proposed development plan (Alternative-9: Irrigation Regulator with LLP and Tubewell development). The JICA Study Team would execute the further survey and studies on the selected plan at the mutual consent under Phase-II.
- (3) In the comparative study, the available surface water is limited to 60% of the 1/10 dependable drought discharge (30 m<sup>3</sup>/sec) in accordance with the general guideline given by NWP, resulting in the limited irrigable area of 20,640 ha. Further possibility to expand the surface irrigation area still remain if the extraction rate can be increased. The JICA Study Team would seek this possibility under Phase-II in consultation with WARPO (formerly MPO).
- (4) The groundwater potential should be exploited within its rechargeable amount mainly in the areas where surface irrigation system would not benefit. Since more than thousand of STWs are presently operated, their potential should not be ignored in the groundwater development plan.
- (5) The proposed FCD/I project would also benefit the inland fishery sector. The benefits from inland fishery should be incorporated in the overall analysis of the Project.

*Liaquat Hossain*  
28.7.92



- (6) The representative from LGEB pointed out that the rural infrastructures such as roads, bridges and growth centers should be studied as one of the possible project components. The Study Team said that only roads and bridges would be considered as the project component to the extent that land acquisition is minimized, and other infrastructure such as growth center would not be included in the project component, though it will be studied.
- (7) The JICA Study Team observed during the field reconnaissance that the existing embankment at Kishorpur was eroded out and the Kishorpur groyne is in state of danger by the recent floods of the Teesta river. BWDB said that urgent measures for the damaged facilities would be undertaken, and therefore no additional study would be required for rehabilitation of these facilities.
- (8) Institutional framework for the implementation of the project as well as the operation and maintenance should be studied under the Phase-II. The required agricultural support services should also be indicated in the forthcoming reports.
- (9) Public consultation survey will be carried out by JICA Study Team. Questionnaires for this survey will be jointly finalized by BWDB and JICA Study Team.
- (10) The Chairman summed up the discussion with many thanks and with the request to the JICA Study Team that bilateral discussions with relevant agencies would be made during Phase-II field work to resolve the above and other issues raised in the meeting.

*Ahsorani*  
*28/7/92*

LIST OF ATTENDANTS

Bangladesh Water Development Board (BWDB)

- |      |                     |   |
|------|---------------------|---|
| (1)  | Liaquat Hossain     | Chief Engineer, Planning                      |
| (2)  | S.A.M. Rafiquzzaman | Director, Planning (general), BWDB            |
| (3)  | Md. Y. Haroon       | Executive Engineer, Planning (general)        |
| (4)  | Md. Akhtar Alam     | Executive Engineer, FPCO, Dhaka               |
| (5)  | Azizul Haque        | Chief Agronomist, WARPO (MPO), Dhaka          |
| (6)  | Md. Munsif Ali      | Agronomist, Land and Water Use, BWDB          |
| (7)  | Md. Amzad Hossain   | Dy. Director, IMED, M/O Planning              |
| (8)  | Md. Moksed Alam     | Senior Technical Design Specialist, LGEB      |
| (9)  | Saroj Kumar Sarkar  | Executive Engineer-I, LGEB                    |
| (10) | Ashraf Ali Khandker | Soil Scientist, Planning (General), BWDB      |
| (11) | Md. Minarul Islam   | Soil Survey Officer, Planning (General), BWDB |
| (12) | Md. Sanaullah       | SDE., Planning (General), BWDB                |

Japan International Cooperation Agency (JICA Advisory Committee)

- |     |             |                                     |
|-----|-------------|-------------------------------------|
| (1) | S. Nakagawa | Chairman of JICA Advisory Committee |
| (2) | A. Shimizu  | JICA Headquarters, Tokyo            |

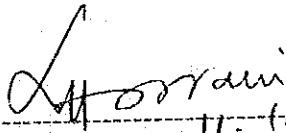
JICA Study Team

- |     |                  |                                       |
|-----|------------------|---------------------------------------|
| (1) | H. Yamamoto      | Team Leader / Irrigation and drainage |
| (2) | N. Ariga         | Agro-economy / Institutional Planning |
| (3) | N. Morioka       | Agriculture / Soil and Land Use       |
| (4) | F. Tamura        | Facility Plan                         |
| (5) | K. Tsumura       | Topographic Survey                    |
| (6) | T. Fukuda        | River Planning                        |
| (7) | K. B. S. Rasheed | Environmental Assessment              |
| (8) | M. A. L. Sarker  | Inland Fishery                        |

*S. Hossain*  
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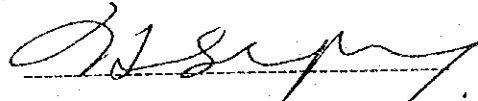
MINUTES OF MEETING  
FOR  
PROGRESS REPORT NO.2  
OF  
FEASIBILITY STUDY  
ON  
THE KURIGRAM IRRIGATION AND FLOOD CONTROL PROJECT  
- SOUTH UNIT -

October 11, 1992  
Dhaka, Bangladesh



11.10.92

MR. LIAQUAT HOSSAIN  
CHIEF ENGINEER (PLANNING)  
BANGLADESH WATER DEVELOPMENT  
BOARD (BWDB)



MR. HIROSHI YAMAMOTO  
LEADER, JICA STUDY TEAM

1. Date and Time: October 10, 1992, 1:45 p.m. - 4:40 p.m.
2. Place: Conference Room of BWDB (Room 301)
3. Attendants: see attached list
4. Summary of Discussions:

The JICA Study Team submitted 20 copies of the Progress Report No.2 to BWDB on October 3, 1992. The discussion meeting on the report was held at the BWDB conference room on October 10, 1992, at the presence of representatives from the concerned agencies. The meeting was presided by Mr. Liaquat Hossain, Chief Engineer, Planning, BWDB. At the request from the Chairman, Mr. H. Yamamoto, leader of the JICA Study Team, explained the outline of the Progress Report No.2 to the attendants. After the presentation of Mr. Yamamoto, various discussions were made and the following were confirmed through the discussions:

- (1) The Progress Report No.2 was appreciated and accepted by BWDB.
- (2) BWDB requested the JICA Study Team to examine a necessity of demonstration farms as one of the project components. BWDB said that the demonstration farm would be needed at least one in each Thana to demonstrate and/or make trials on (i) institutional build-up and arrangement for Command Area Development (CAD) with LLPs / Tubewells, (ii) physical planning and designs of CAD and (iii) irrigation water management for cultivation. The Study Team said that the request would be conveyed to the JICA office.
- (3) Groundwater development mode should not be limited to DTWs, because groundwater resources would be developed easier by STWs or other modes with simple technology and low investment. Possible development modes should be tested in demonstration farms. BWDB said that, although overall irrigation development plan should include the groundwater component, the installation of tubewells for groundwater irrigation development should not be a project component, excepting the demonstration farms. The groundwater components should be made by private initiatives in view of the government policy shift to privatization and successful performance of private sector on tubewell development.

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- (4) BWDB strongly requested the Study Team to examine the erosion protection works (river bank protection) as one of the project components. The Team said that these erosion protection works should be recognized as an urgent maintenance work of the existing embankment and should not be delayed until the proposed project be implemented. Therefore, erosion protection works will not be considered as one of the project components; however, possible recommendations for urgent protection works would be presented in the forthcoming report.
- (5) Economic feasibility of the proposed drainage improvement works, particularly use of LLPs for drainage, should be examined under further studies. BWDB said that idea of "operation of LLPs for drainage" should be tested in the demonstration farms in low-lying area (F1 land).
- (6) The proposed institutional arrangement was basically accepted by BWDB with the following suggestions:
  - a) There should be recommendations demarcating responsibilities of each agency both for implementation and O&M with coordination arrangement;
  - b) The "Project Beneficiary Committee (PBC)" at Union level should be involved in identifying qualified owner-farmers/cultivators for land acquisition; otherwise land acquisition process may take longer time;
  - c) Demonstration farm should be implemented and managed jointly by BWDB / BRDB / DAE;
  - d) For sustainable O&M, local resources should be mobilized. Water rate for irrigation should be collected from the beneficiaries through BWDB or appropriate agency as per decision of GOB;
  - e) O&M office should be established after the implementation of the project, and be responsible for all categories of O&M including emergency maintenance and rehabilitation or re-construction ; and
  - f) Institutional framework for proper O&M and required agricultural support services should further be elaborated in the forthcoming reports.
- (7) BWDB said that installation of LLPs should not be considered as a project component in view of recent GOB's policy shift to privatization and further selection of pump size should be left to farmer's option. Installation costs of LLPs would be counted in farm budget analysis as a part of irrigation costs (crop production costs).

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- (8) BWDB requested that the project costs estimates should be made in accordance with the "Guidelines for Project Assessment" by FPCO and the required funds for O&M during the construction stage should be included in the project costs accordingly.
- (9) BWDB pointed out that drainage structures should be planned and designed not to effect over-drainage problem at the end of monsoon season.
- (10) During the meeting, various concerned offices of BWDB and other related agencies such as LGED, DOL and FPCO submitted their written comments and suggestions. Further comments and suggestions particularly from WARPO, BRDB and DAE would be sent to the Study Team through the JICA Bangladesh Office, if any, by October 20, 1992.
- (11) The "Draft Final Report" will be submitted by the end of December, 1992 through the JICA Bangladesh Office. The Team will visit Bangladesh again in mid January to discuss the report.
- (12) The Chairman summed up the discussion with thanks, and requested the Study Team to examine carefully the above and other issues raised in the meeting during further studies in Japan.

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LIST OF ATTENDANTS

Bangladesh Water Development Board (BWDB) and Concerned Agencies

- |      |                        |  |
|------|------------------------|--|
| (1)  | Liaquat Hossain        | Chief Engineer, Planning                                 |
| (2)  | Md. Mescr Ali Khan     | Chief Engineer, Project IV, Rangpur                      |
| (3)  | A. K. M. Anisur Rahman | SE, Teesta Project Canal Circle-II, Rangpur              |
| (4)  | S.A.M. Rafiquzzaman    | Director, Planning (general), BWDB                       |
| (5)  | Nityananda Chakravorty | Director, Economic Planning, BWDB                        |
| (6)  | Fariduddin Khan        | Director, GWC-II   |
| (7)  | Md. Yusuf Haroon       | Executive Engineer, Planning (general)                   |
| (8)  | Md. Delwar Hossain     | Executive Engineer, FPCO, Dhaka                          |
| (9)  | Moinuddin Ahmed        | Chief Agronomist, Land and Water Use                     |
| (10) | Azizul Haque           | Chief Agronomist, WARPO (MPO), Dhaka                     |
| (11) | Md. Amjad Hossain      | Dy. Director, IMED, M/O Planning                         |
| (12) | Md. Moksed Alam        | Sr. Technical Design Consultant, ISP/RESP, LGED          |
| (13) | M. A. Muttaled         | Chief Soil & Agricul. Survey Officer, Planning (general) |
| (14) | Ashraf Ali Khandker    | Soil Scientist, Planning (general), BWDB                 |
| (15) | Md. Minarul Islam      | Soil Survey Officer, Planning (general), BWDB            |
| (16) | Md. Sanauallah         | SDE., Planning (general), BWDB                           |

Embassy of Japan

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| (1) | A. Ito | Second Secretary |
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JICA Study Team

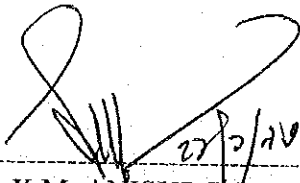
- |     |                  |                                       |
|-----|------------------|---------------------------------------|
| (1) | H. Yamamoto      | Team Leader / Irrigation and drainage |
| (2) | N. Ariga         | Agro-economy / Institutional Planning |
| (3) | N. Morioka       | Agriculture / Soil and Land Use       |
| (4) | F. Tamura        | Facility Plan                         |
| (5) | K. Tsumura       | Topographic Survey                    |
| (6) | Y. Fukasaka      | Project Evaluation                    |
| (7) | K. B. S. Rasheed | Environmental Assessment              |
| (8) | M. A. L. Sarker  | Inland Fishery                        |

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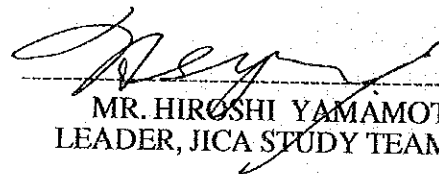
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MINUTES OF MEETING  
FOR  
DRAFT FINAL REPORT  
OF  
FEASIBILITY STUDY  
ON  
THE KURIGRAM IRRIGATION AND FLOOD CONTROL PROJECT  
- SOUTH UNIT -

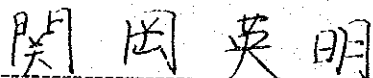
January 20, 1993  
Dhaka, Bangladesh



MR. A.K.M. ANISUR RAHMAN  
SUPERINTENDING ENGINEER  
TEESTA PROJECT CANAL CIRCLE - II  
BANGLADESH WATER DEVELOPMENT  
BOARD (BWDB)



MR. HIROSHI YAMAMOTO  
LEADER, JICA STUDY TEAM



WITNESS: MR. HIDEAKI SEKIOKA  
LEADER, JICA ADVISORY COMMITTEE



1. Date and Time: January 20, 1992, 12:30 - 14:30 p.m.
2. Place: Conference Room of BWDB (Room 301)
3. Attendants: see attached list
4. Summary of Discussions:

The JICA Study Team submitted 25 copies of the Draft final Report to BWDB through the JICA Bangladesh Office in mid January, 1993. The discussion meeting on the Draft Final Report was held at the BWDB Conference room on January 20, 1993, at the presence of representatives from the concerned agencies. The meeting was presided by Mr. A.K.M. Anisur Rahman, Superintending Engineer, Teesta Project Canal Circle-II, BWDB, Rangpur, in absence of the Chief Engineer, Planning, BWDB. At the request from the Chairman, Mr. H. Yamamoto, leader of the JICA Study Team, introduced the team members and explained the outline of the Draft Final Report to the attendants. After the presentation of Mr. Yamamoto, various discussions were made and the following were confirmed through the discussions:

- (1) The "Draft Final Report" is well-focussed, and the approaches and concept of the Project described are agreed with the national water development policies and on-going FAP studies. The Draft Final Report is therefore acceptable to BWDB.

- (2) During the meeting, the following offices and agencies discussed/submitted their written comments and suggestions on the "Draft Final Report" :

- Ministry of Irrigation, Water Development and Flood Control (MOIWDFC)
- Water Resources Planning Organization (WARPO)
- Flood Control Coordination Organization (FPCO)
- Directorate of Environment (DOE)
- Local Government Engineering Department (LGED)
- BWDB concerned offices

Further comments and suggestions from other related agencies would be sent to the Study Team through the JICA Bangladesh Office by February 15, 1993. The JICA Study Team in turn will examine these comments and suggestions and reflect those in the "Final Report".

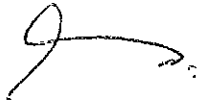
- (3) The agreed minutes of the meeting will be sent to the Economic Relations Division (ERD), Ministry of Finance, for information.


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- (4) The Chairman summed up the discussion with thanks, and requested the Study team to re-examine the above and other issues raised in the meeting during finalization of the "Draft Final Report" in Japan.

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LIST OF ATTENDANTS

Bangladesh Water Development Board (BWDB) and Concerned Agencies

- |      |                      |  |
|------|----------------------|--|
| (1)  | A.K.M. Anisur Rahman | SE, Teesta Project Canal Circle-II, Rangpur, BWDB                  |
| (2)  | Emam H. Khan         | Director, Land and Water Use, BWDB                                 |
| (3)  | S.A.M. Rafiquzzaman  | Director, Planning (General), BWDB                                 |
| (4)  | M.C. Dey             | Economist, Economic Planning, BWDB                                 |
| (5)  | Md. Munsif Ali       | Agronomist, Land and Water Use, BWDB                               |
| (6)  | Md. Y. Haroon        | Executive Engineer, Planning (General), BWDB                       |
| (7)  | Fakhrul Islam        | Dy Chief Agronomist, Planning (General), BWDB                      |
| (8)  | M.A. Muttaleb        | Chief Soil & Agricultural Survey Officer, Planning (General), BWDB |
| (9)  | Md. Minarul Islam    | Soil Survey Officer, Planning (General), BWDB                      |
| (10) | Md. Abdus Samad      | Sr. Agric. Planning Officer, Planning (General), BWDB              |
| (11) | Md. Delwar Hossain   | Executive Engineer, FPCO   |
| (12) | Md. Z. Haider        | Executive Engineer, Design -7, BWDB                                |
| (13) | M.K. Farooque        | Joint Director, DOE  |
| (14) | MD. A. Sattar        | Dy. Director, SWH-1, BWDB  |
| (15) | Md. Moksed Alam      | Sr. Technical Design Consultant, ISP, LGED                         |
| (16) | G.J.N. Murshed       | Sr. Scientific Officer, WARPO                                      |
| (17) | Murshed Ahmad        | Chief Economist, WARPO   |
| (18) | K.A. Khaleque        | Dy. Chief, Planning, MOIWDFC                                       |
| (19) | Md. Sanaullah        | SDE, Planning (General), BWDB                                      |

Embassy of Japan


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| (1) | A. Ito | Second Secretary |
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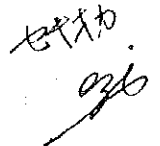
JICA Advisory Committee

- |     |            |                                 |
|-----|------------|---------------------------------|
| (1) | H. Sekioka | Leader, JICA Advisory Committee |
| (2) | A. Shimizu | JICA Headquarters, Tokyo        |

JICA Study Team

- |     |             |                                       |
|-----|-------------|---------------------------------------|
| (1) | H. Yamamoto | Team Leader / Irrigation and drainage |
| (2) | N. Ariga    | Agro-economy / Institutional Planning |

 27/7/26



JICA