Mid-term Evaluation
of
Gorai River Restoration Project, Phase-II

Final Report

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Evaluation Sector
Implementation Monitoring and Evaluation Division
Ministry of Planning

Foreword

Bangladesh Water Development Board (BWDB) under the Ministry of Water Resources (MoWR) implemented a project "Gorai River Restoration Project (Phase-II)" during November 2009 to June 2014 with the financial support of Government of Bangladesh. The main objective of the project is to prevent environmental degradation in the south-western region especially Khulna, the coastal belt and in Sundarban through dredging at Gorai river to ensure fresh water flow in the dry season.

Evaluation Sector of the Implementation Monitoring and Evaluation Division (IMED), Ministry of Planning under took a Mid-Term Evaluation Study (MES) for the "Gorai River Restoration Project (Phase-II)". The evaluation was conducted by Mr. Saifullah Talukder (individual consultant), which was selected through open competition. The purpose of the MES was to evaluate the implementation status of the "Gorai River Restoration Project (Phase-II)" and its effect on the living standard of the community.

The findings of the study indicate that the salinity level of the river and their waterways around Khulna and Sundarban Reserved forest have not yet been reduced to the desired level. The activities of the project have started bringing positive impacts on food production, employment and living standards of the community. The findings of this report were shared through a dissemination workshop with project implementers, professionals and policy makers.

I congratulates Mr. Saifullah Talukder, individual consultant for successfully conducting the evaluation work and presenting the report in time. I also thank Salma Mahmud, Director General of Evaluation Sector along with her colleagues for providing guidance and supervisory support to the consultant.

I hope that the findings and recommendations of the study would enrich future management of the "Gorai River Restoration Project (Phase-II)" as well as similar dredging projects of the country.

(Suraiya Begum ndc)
Secretary
IMED, Ministry of Planning

PREFACE

The Mid-term Evaluation Study of 'Gorai River Restoration Project (Phase-II)' has been carried out by Mr. Saifullah Talukder, Individual Consultant, ws recruited through an open competition. The project is being implemented by BWBD under the Ministry of Water Resources. The original investment cost of the project was BDT 942.1 crore (GOB) and the implementation period was from November 2009 to June 2014. The main objective of the project is to prevent environmental degradation in the south-western region especially in Khulna, the coastal belt and in Sundarban by undertaking restoration of Gorai River and hence ensuring fresh water flow in the wet season and augmenting the flows during dry season.

The main activities of the study were to i. review the implementation status of major components of the project (physical and financial) ii. to examine procurement process ii. to assess projects impact in terms of reduced salinity, more surface and ground water, lesser environmental pollution etc iv. to identify the strength and weakness and possible threat towards affective management of Gorai River restoration.

The study reviewed the present salinity status of the rivers and their waterways around Khulna and Sundarban Reserve forest and found that the target of this component is yet to achieve. The income and agricultural production of the beneficiaries have been increased due to implementation of the project.

I would like to thank Mr. Saifullah Talukder, Individual Consultant and the concerned officers of Evaluation Sector for completion of the report in time. Thanks are also due to all members of the technical and steering committee especially to the Secretary, IMED for providing useful advice and guidance. Appreciations should to the learned participants of the workshop for their observation which have been duly incorporated in the report.

I believe that the findings and recommendations as put forward in the report will contribute to a great extent for future planning, management and effective implementation of the project similar in nature to be implemented by BWDB.

Salma Mahmud
Director General
Evaluation Sector, IMED
Ministry of Planning

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Executive Summary

1. Background

In 1975, India commissioned a barrage across the Ganges at Farakka in West Bengal to divert 40000 cusec of water into Bhagirathi-Hoogli river to improve the navigability of Calcutta Port. This has decreased considerably the discharge of Ganges and Gorai in Bangladesh part. As affect of this, the off-take of Gorai used to be silted up in lean period and water from Ganges to Gorai can not flow due to this blockade. As a result, fresh water flow through Gorai-Rupsha-Passur River System gradually decreases and upward intrusion of saline water from Bay of Bengal increases due to tidal effect. Thus the salinity increases in the region. As salinity is increasing, the effect is being observed in A) Environmental degradation, B) Socio-economic condition of South-Western part of Bangladesh. One Detailed Feasibility Study was carried out by DHV-Haskoning and Associates in 2001 and the Project named Gorai River Restoration Project, Phase-II was taken up in 2009.

2. Summary of the Project

a) Name of Project	Gorai River Restoration Project (Phase-II)
b) Administrative Ministry/Division	Ministry of Water Resources.
c) Executing Agency	Bangladesh Water Development Board.
d) Location of the Project	Kushtia Sadar, Kumarkhali, Khuksha.
e) Estimated cost (in lakh taka)	GoB 94214.55 lakh taka (original)
f) Date of commencement	November, 2009.
g) Date of completion	June, 2013 (Original) June 2014 (Extended)

3. Objective of the Project

The main objective of the project is to prevent environmental degradations in the South-western region, especially around Khulna, the coastal belt and in the Sundarbans, by undertaking the restoration of the Gorai River and hence ensuring fresh water flow in the wet season and augmenting these flows during the dry season.

4. Methodology

The Project Director and his office was contacted off and on for collection of different information/papers/reports etc. IWM was contacted to know their activities in the Project. Questionnaires were prepared for collection of replies from a) Beneficiaries, b) Officials, c) Consultants and d) FGD meetings. The Consultant went to Kushtia for site visit of the Project and went to Khulna for collection of information from Khulna WASA and Forest Department regarding salinity of rivers. After collection of these information, the report has been prepared.

5. Observations

The latest Progress Report up to April, 2014 as submitted by the Project Director in the IMED 05 Form has been studied and used as the basis of the following observations;

1) Physical and Financial Progress:

- The total cost of the project is 94214.55 lakh taka & expenditure up to April, 2014 is 48215.28 lakh taka. Financial progress is 51.17% & Physical progress is 56.82%.

Capital Dredging component with 1st year Maintenance has been completed 100%, Training component has also been completed 100%. Physical progress of Procurement of 2 nos. dredgers is 98% and Financial Progress is 90%. The official taking over of the dredgers have not yet been taken up.

2) Achievement of objectives:

- **Salinity**
  The main objective of the Project was to lower down the salinity level to 1 ppt at Khulna and 20 ppt around the Sundarbans Reserved Forest. But the result shows that the target has not yet been achieved.
- **Surface and Ground water level**
  The level of surface water and ground water has been observed to be increased.
- **Irrigation**
  The Irrigation Position has improved with the increase of surface and ground level.
- **Crop productivity**
  Crop production has increased with the improvement of Irrigation facilities.
- **Fish productivity, navigation & Cost of river transport**
  The river Gorai remains dry for about 6 months in a year but when the water starts flowing from Ganges to Gorai in the wet season, the fish production and navigation increases. Cost of river transport is always cheaper.
- **Rural Employment**
  Rural employment was observed to have been increased. Though the fishermen and boatmen suffer in the lean period when there is no water in Gorai, they work in agriculture and sand trading business and go back to their original profession in the wet season. Their number is very small in comparison to the number of other professions. The farmers and the sand trading related people are getting more scope of work and employment opportunity.
- **Environment**
  Impact on environment can be assessed after six years from the starting of the Project. This Project was started in November, 2009. Hence environmental impact evaluation may be done in 2016.

6. Strength & Weakness of the Project

- BWDB's capability and expertise in implementing big Projects like this one, and the Procurement of 2 nos. dredgers are the main strength of the Project.
- Shortage of manpower in operation & maintenance of the 2 nos. dredgers, discontinuity in dredging program for the successive years and spoil management etc. are the main weaknesses of the Project.

7. Recommendations

a) The Maintenance Dredging in Gorai should be continued every year. Fund for it should be ensured.
b) Maintenance Dredging should be started in proper time and not later than October every year.
c) Subject to clearance from the committees formed by BWDB/MoWR for checking the specification, the taking over of the 2 nos. dredgers should be settled without any further delay.
d) The dredgers are being used in the Project before taking over. Care should be taken so that no litigation arises out of it.
e) The Training to be imparted to the mechanical personnel of BWDB by the supplier should immediately be completed under the Contract. The Project Director will place the personnel without any delay.
f) The operation & maintenance of the two dredgers may be run by engagement of required manpower through outsourcing.
g) Budget for yearly maintenance dredging should be ensured when the Project is in the Development Budget and when it comes in the Revenue Budget.

h) Nomination of officers for any foreign training, should be so made that the knowledge gathered in the training may be utilized in the project and in no way the officers are transferred to other posting after the training .

i) During FGD meetings, some people of Kumarkhali and Khoksha raised objection that the erosion was being done by dredging. BWDB along with IWM should meet the people and look into the problem.

j) BWDB should maintain contact with forest department, Khulna WASA and Public Health Engineering for monitoring of project objective.

k) Close monitoring should be made so that objective of the project is achieved.

l) BWDB should take seriously the spoil management.

Acronyms

BWDB	Bangladesh Water Development Board
CE	Chief Engineer
DPP	Development Project Proposal
FGD	Focus Group Discussion
GoB	Government of Bangladesh
IMED	Implementation Monitoring & Evaluation Division
IWM	Institute of Water Modelling
MoWR	Ministry of Water Resources
PC	Planning Commission
PCR	Project Completion Report
PD	Project Director
SC	Steering Committee
SDE	Sub-Divisional Engineer
SE	Superintending Engineer
SPSS	Statistical Package for Social Science
TC	Technical Committee
ToR	Terms of Reference
UNO	Upazilla Nirbahi Officcer
UP	Union Parishad
XEN	Executive Engineer

Chapter 1

Background information

1. Introduction

Gorai River Restoration Project (Phase-II) is an on-going Project of Annual Development Program (ADP) being financed by Government of Bangladesh (GOB) and implemented by Bangladesh Water Development Board (BWDB) under the sponsorship of Ministry of Water Resources (MOWR). The Project was commenced in November, 2009 and targeted for completion in June, 2013 but the completion time has been extended up to June, 2014 (for specific reason). IMED has appointed an Individual Consultant to complete Mid-term Evaluation of the Project through which the latest progress as well as the implementation status of main components and the achievement of the objectives of the Project will be evaluated.

1.1 Project background

Bangladesh is located in the Delta of the three great rivers, the Ganges, the Brahmaputra and the Meghna. The Ganges Dependent Area (GDA) in the south-western region of Bangladesh (Fig 1.1) constitutes about 37 percent of the total area of the country. About one third of the population of the country lives in this area. The Ganges is the only source of fresh water for a vast area of this region. Sustainable Water Resources Management in this region is very important for rising productivity of agriculture, forestry and fisheries and promoting balanced economic growth.

In 1975, India commissioned a barrage across the Ganges at Farakka to divert 40,000 cusec water into the Bhahgiratthi-Hoogly rivers in West Bengal, India for the purpose of flushing the silts to improve the navigability of the Kolkata Port to the Bay of Bengal. Due to diversion in the upstream, the flows in the Ganges downstream of Farakka reduced considerably. This affected seriously agriculture, fisheries, forestry, navigation, domestic water supply and industrial development in the Ganges Dependent Area within Bangladesh. The world's largest mangrove forest, the Sundarbans is on the verge of extinction because of high salinity levels in the rivers and channels surrounding the Sundarbans during the dry season.

The Gorai river is an important distributory of Ganges river and one of the main rivers of the south-western region of Bangladesh. With the reduction of discharge of Ganges, Gorai river has also been experiencing the same problem of reduction of discharge which was causing siltation at its bed throughout the length. Particularly, heavy siltation has been observed to occur at the off-take of Gorai from Ganges river. The rate of siltation here was so high that the off-take of the river was used to be completely silted up, blocked and discontinued its flow from the Ganges at Talbaria under Kushtia district in the month of December, 1988. The blockade of the off-take used to be continued until May next year and breached due to on-rush of water from Ganges when the water level of Ganges was on the rise in the wet season. After the breach, the water used to start flowing from Ganges to Gorai again. Gorai River flows towards south for about 200 km up to the point at Bardia where the rivers Nabaganga meets Gorai. From here, Nabagnga flows towards south and Gorai also flows towards south taking the name Madhumati. Nabaganga meets the river system of Rupsha-Passur and their water-ways and finally falls into Bay of Bengal. Similarly, Modhumoti meets with Baleswar River and its water-ways and finally falls into Bay of Bengal. The tidal effect is felt up to upstream of the confluence point at Bardia. As the fresh water from north is gradually reducing through Gorai, Modhumoti and Naboganga, the salinity is increasing due to upward flow of water caused by the tidal effect.

This incident of blockade at the off-take and discontinuation of water from Ganges to Gorai was causing serious threat to the environmental degradation and salinity intrusion from the south. With a view to minimizing this, the river Gorai was dredged during 1991 and 1992 by Dredger Directorate of BWDB under GOB funding to improve the fresh water supply through it towards south.

Several studies were carried out to address the problem. Of them, one Study was carried out by Asian Development Bank from 1989-93 called Flood Action Plan (FAP Study) dividing Bangladesh in to eight (08) regions and conducting region-wise Study. For South-Western Region involving Ganges dependent Area falls in the Region-4 and the Study is named as FAP-4 Study.

The study recommended dredging of the Gorai off-take with ancillary structures following the objective as:

- To prevent the environmental degradation in the GDA of south-west region, coastal belt and the Sundarbans by undertaking the restoration of Gorai river.
- Ensuring fresh water in the wet season and augmenting dry season flow.

The Government of the People's Republic of Bangladesh and India signed the historic treaty on the sharing of the Ganges water at Farakka Point on the 12th December, 1996. The treaty provides for sharing of water at Farakka for the period covering January 01 to May 31 every year. In order to utilize the Ganges water for the benefit of the people living in the Ganges Dependent Area and to offset the negative impacts of the continuous withdrawal of water upstream of Farakka, the dredging of Gorai river was taken up to give benefit for the Gorai basin also.

The Government of Bangladesh had undertaken the Gorai River Restoration Project (GRRP) with the assistance of Netharlands and Belgium. The Gorai river had been dredged starting from off-take to 20 km during the successive 3 years: 1998, 1999 & 2000 under a Pilot Priority Works (PPW). Maintenance dredging was not continued just after the completion of the Project in 2000. This time, one Feasibility Study was carried out by DHV-Haskoning & Associates in 2001. The Feasibility Study (FS) and detailed Engineering Design of GRRP were prepared by the Main Consultant (DHV-Haskoning & Associates). They recommended the components of works including the following which would guide more water in to the Gorai during lean season while excluding sediment during monsoon season and thus minimizing maintenance dredging:-

Components of option AIR:

- Flow divider at the off-take in the Ganges-Gorai Guide bundh.
- River training works along the Gorai (between Talbaria & Gorai Railway Bridge and restructuring of RTW at Kumarkhali).
- Dredging of clay-layer just downstream of Gorai off-take in the Gorai River.

A committee was formed in March, 2009 by BWDB for technical study in the light of the study carried out by DHV-Haskoning & Associates, 2001 and on the basis of the technical study, the DPP of the Project GRRP, Phase-II was prepared in May, 2009.

1.2 Project Summary

a) Name of Project	Gorai River Restoration Project (Phase-II)
b) Administrative Ministry/Division	Ministry of Water Resources.
c) Executing Agency	Bangladesh Water Development Board.
d) Location of the Project	Kushtia Sadar, Kumarkhali, Khoksha.
e) Estimated cost (in lakh taka)	GoB 94214.55 lakh taka (Original)
f) Date of commencement	November, 2009.
g) Date of completion	June, 2013 (Original), June 2014 (Extended)

1.3 Objectives & Targets of the Project

The main objective of the project is to prevent environmental degradations in the South-western region, especially around Khulna, the coastal belt and in the Sundarbans, by undertaking restoration of the Gorai River and hence ensuring fresh water flow in the wet season and augmenting these flows during the dry season.

The most prominent ecological and environmental services to be restored include:-

1. Reduction of surface water salinity to the threshold of 1 ppt at Khulna.
2. The reduction of salinity in the impacted zone of the Sundarbans to less than 20 ppt within the river systems in order to protect the ecological functioning and associated threats to biodiversity within the Sundarbans Reserved Forest.
3. Maintenance of a resource utilization profile for the Sundarban Reserved Forest.
4. Increasing dry season flow to enable fish migration and production from the river and associated waterways.
5. Waste assimilation and the need to dilute pollution hotspots such as those around Khulna and Mongla.
6. Navigation services of the river.
7. River and riparian zone biodiversity and aesthetics.

8. Enhanced ground water and surface water supply.
9. Increased quality of domestic water supply.

1.4 Major components of works:

Economic code	Code description	Quantity/unit	Estimated cost GoB (FE)
A. Revenue Component			
4886	Bathymetric survey for pre-work and post work measurement.	1 item.	378.00
4899	Morphological Mathematical Modelling for Planning, Design, Monitoring, Quality Control & Impact Assessment of Dredging.	1 item.	450.00
4899	Planform Study adjacent to Gorai Off-take (at Ganges) in connection with effectiveness of proposed guide bund & flow divider.	1 item.	150.00
4840	Training- 1 item.	1 item.	300.00
B. Capital Component			
8614	Purchase of Dredger with accessories- 2 sets.	2 sets.	23400.00
7901	Custom duties (Capital head).	L/S	2600.00
C. Capital Dredging			
7041	Initial Priority Dredging for removal of silt from the offtake of Gorai River		
7041	By BWDB own dredgers (15 lakh cum, part of capital dredging of 113.00 lakh cum)	15.00 lakh cum	2122.50
7041	By other local outsourcing (private and dredger) 5.00 lakh cum, part of capital dredging of 113.00 lakh cum	5.00 lakh cum	707.50
7041	Capital Dredging of Gorai River (1st year Capital Dredging, 113-20-5=93 lakh cum), by International Dredging Contractors by outsourcing	93.00 lakh cum	15810.00 (12648)
	Total Capital Dredging	113.00 lakh cum	
A. Maintenance Dredging			
7041	Maintenance Dredging (2nd year maintenance dredging, 50% of capital {0.50x113.00} = 57 lakh by International out sourcing.	57.00 lakh cum	8379.00 (6703.00)
7041	Maintenance Dredging- 3rd year 30% of capital dredging) 34.00 lakh cum.	34.00 lakh cum.	4811.00 (-)
7041	Maintenance Dredging – (4th year 20% of capital dredging) 23.00 lakh cum.	23.00 lakh cum.	3254.50 (-)
	Total maintenance Dredging	114.00 lakh cum	
B. Structure			
7041	Construction of Flow Divider at the source of Gorai – 1 item (indicative cost, Considered to be financed by WB).	Approx. 2200.00 meter.	15000.00 (-)
7041	Ganges-Gorai Guide Bund – 1 item (Indicative cost, Considered to be financed by World Bank).	1987.47 meter	12000.00 (-)

1.5 Outputs/Outcomes (As per DPP)

The benefits from the implementation of Gorai River Restoration Project are generally two types:-

A. Environmental.

B. Socio-economic.

- Environmental benefits are:-

a) To protect the Environment and Biodiversity of Sundarbans Reserved Forest.
b) To restore the environmental and ecological balance within the project area.

Environmental benefits are available for a long turn. It is considered that the environmental benefits of the Sundarbans will be available after six years from the implementation of the Project.

- The following aspects are listed to include the socio-economic benefits:-

1) Benefits from the Sundarbans.
2) Agriculture.
3) Fisheries.
4) Rural and urban drinking water supply.
5) Industrial Water Supply.
6) Navigation and
7) River bank erosion and land reclamation.

Chapter 2

Assignment, Approach & Methodology

2.1 Objective of the Current Assignment:

As per Terms of Reference (ToR), the assignments are as follows:-

i) To review the implementation status of major components of the project (physical and financial)

ii) To examine whether the procurement process (Invitation of tenders, evaluation, approval procedures, contract award etc.) of the packages (goods, works and services) under this project was followed as per PPR'08.

iii) To assess project's impact in terms of reduced salinity, more surface and ground water for domestic use, irrigation of land, crop, fish and forest productivity, navigability and cheaper cost of river transport, reduction in cost and loss of crops, loss of water ecological balance, lesser environmental pollution, increased rural employment and reduced poverty of the rural people.

iv) To identity the strengths and weaknesses and possible threats towards effective management of Goral River restoration and its sustainability.

2.2 Scope of Services:

The consultant prepared the study design and planned field works considering the following components of the project. Sampling of the evaluation study has been made on the basis of coverage of work and area mentioned below:

Coverage of Work		Area Coverage
I)	Implementation as well as the present functional status of dredging and maintenance dredging of Goral River restoration.	100 % of the Upazila encompassing the Goral Project area.
II)	Assessing the productivity of crops, fishing, forest, use of irrigated lands, use of water, navigation, rural, employment and poverty status of the community to the adjoining areas of the Goral project.	
III)	Interviewing direct beneficiaries/rural poor and conducting in-depth discussions and FGD meetings with community leaders, teachers, key officials/ informants and concerned stakeholders etc.	

The Consultant provided the technical assistance to make the evaluation results precisely complied, articulated & for the purpose he would be responsible for the following:-

1) The Consultant prepared study design and Data Collection Instrument (DCI).
2) The Consultant trained the field staff to be recruited for data collection.
3) The Consultant met the Project authorities, if and when necessary.
4) The Consultant physically visited and monitored the sample area.
5) The Consultant wrote draft report and would present it to the Technical Committee and Steering Committee for approval from the concerned authority.
6) The Consultant would present papers and evaluation report in the workshop and finalize the report in the light of recommendations of the seminar/workshop.

2.3 Methodology

Since the purposes of the assignment are to monitor the implementation status of the major components with a view to assessing the productivity of the crops, fisheries, forest, irrigation, navigation etc and impact on over-all socio-economic development of the rural community, appropriate design has been used to address the assessment and come out with the outcome.

The Study Design has been prepared in such a way that it would conform to the scope of Services i.e. Coverage of Work and area of Coverage. Accordingly, the steps of modality has been taken as follows:-

1. First, the PD of the Project was interviewed for obtaining an over-all picture of the Implementation of the component of works. In course of the Study, the PD office was contacted off and on for different information.

2. IWM has been engaged as Consultant for fixation of alignment of the dredging works on the basis of Mathematical Model Study and for assessment of dredged volume of earthwork of Gorai River and monitoring of the achievements of the objectives of the Project. They worked under two separate contracts with BWDB. So it was imperative to contact IWM to know their activities regarding the fixation of alignment, procedure for assessment of dredged volume of earthwork of Gorai River and monitoring procedure for the objectives of the Project.

3. It is seen that the DPP has provision for engagement of one (1) Procurement Specialist and Mr. Matiar Rahman has been engaged for the same. He was contacted to know his activities with the Project.

4. Five sets of Questionnaires- one for the beneficiaries such as farmers, fishermen, boatmen and sand traders, one for the Project Officials, one for the Consultants of the Project, one for the Offices related to the Project and the last one for the FGD meeting were prepared to collect information through interviews by the field staff and the Consultant himself. The questionnaires were prepared in such a way that the views of the beneficiaries and the officials were elicited.

5. The Consultant visited the site at kushtia. During site visit, he observed the present morphological condition of River Gorai. He visited the dredgers and dredging works being done by them, discussed with the Executive Engineer and monitored the activities of the Field Staff in the collection of the replies to the questionnaire. He facilitated the FGD meetings held in three (3) Upazillas named Kushtia Sadar, Kumarkhali and Khoksha.

6. The Consultant went to Khulna. On that day, he went to the office of Khulna WASA and discussed with DMD, then to the office of DFO, Sundarbans Reserved Forest (West) and discussed with the DFO. Then discussed with the SDE, Khulna Hydrological Sub-division. All the discussions were made to know the salinity condition of the rivers and their water-ways around Khulna town and Sundarbans Reserved Forest.

2.4 Sampling Size

The sample size for the study will be determined by using the following statistical formula:-

$$n = \frac{z^2 pq}{d^2} \times design\ \ effect$$

$$= \frac{(1.96)^2 \times .70 \times .30}{(.05)^2} \times design\ effect$$

$$= \frac{3.84 \times .21}{.0025} \times design\ effect$$

$$= \frac{.8064}{.0025} \times design\ effect$$

$$= 323 \times 2 = 646 \approx 700$$

Where, n = Sample size (to be determined)
p = Target Population Proportion
q = 1-P
d = Error level
z = the value of standard variate at a given confidence level

Considering the design effect to be 2 because of variation in the target population among the upozillas.

Category wise allocation of sample:

1. Farmers- 430
2. Fishermen- 50
3. Boatmen- 50
4. Sand Traders- 170

   Total- 700

Systematic Sampling will be used to select the target household.

No. of respondents-10(Officials) & 30(From FGD at 3 upazillas)

Following the formula, the sample size has been determined to be as 700. The total number of officials and FDG is 40 and as such the total number of respondents becomes 740. These respondents (beneficiaries) are distributed among the 3 upazillas over which the project i.e., dredged length of work runs and in consideration of the volume of work and length under each upazilla. The total list containing the category wise allocation of sample and upazilla wise respondents are given in the following format.

Number of Upazillas and Upazilla-wise length of dredging, corresponding size of Respondents

Upazilla	Length of dredging works (km)	Stakeholders				Officials of the Project	Officials relating to the Project	No. of FGD	Total respon-dents
		Farmers	Fisher-man	Boatman	Sand traders				
Kushtia	8.5	85	10	10	60	5	5	10	175
Kumarkhali	20	295	25	25	100			10	455
Khoksha	1.5	50	15	15	10			10	110
Total	30	430	50	50	170	5	5	30	740

2.5 Study Respondents

The major units of this study are: i) the first units of study will be the stakeholder of the project such as farmers, fishermen, boatmen, sand traders etc. ii) 2nd unit of study are the officials of the project such as the Project Director and the Executive Engineers (Civil/Mechanical), iii) The 3rd unit is the Consultant of the Project such as Procurement Specialist and representative of IWM iv) the officials who are related to the project and responsible for collection and preservation of hydrological data such as System Analyst of Hydrology, BWDB, Dhaka and concerned officials of Khulna WASA and the Sundarbans Reserved Forest and v) 5th unit will be the UNO, local leaders of respective political parties, local administration and law-enforcing agencies, chairman, members, teachers, etc for FGD meeting. The questionnaires have been prepared for each category of respondents.

2.6 Recruitment of field staffs and their training

A total of 10 field staffs have been engaged by IMED for collection of data from the field. Of them, three were engaged for Kushtia Sadar Upazilla, 5 for Kumarkhali Upazilla and 2 for Khoksa Upazilla. Before going to the field, they were given 1 day training regarding the questionnaire and other aspects of data from the field. They collected data from 08-04-2014 to 21-04-2014 from the field.

2.7 Inception Report

The Technical Committee Meeting on the Inception Report was held on 10-12-2013. The Steering Committee meeting was held on 17-02-2014. The Technical Committee meeting was again held on 11-03-2014 and the Steering Committee meeting was held on 05-04-2014. The Inception Report was approved in that meeting. The minutes of the meeting are enclosed with the Report.

Chapter 3

Analyses and Findings of Data

3.1 Findings from Survey:

Table # 3.1 below shows that occupation of respondents interviewed were 61.4% involved in agro farming, 7.1% in fish farming, 7.1 % in boat and 24.3% of the respondents involved as sand traders.

Table # 3.1 : Occupational status of respondents

Type of occupation (n=700)	Number	%
• Farmers /agriculture	430	61.4
• Fisher/fish farming	50	7.1
• Boatman	50	7.1
• Sand traders	170	24.3
Total respondents	700	100.0

3.2 Income, expenditure and saving status of respondents:

The table # 3.2 below shows that farmers' household monthly income as well as expenditure have increased in 2013 in comparison with those of 2009 but due to increased expenditure farmers savings in 2013 has been slightly reduced than that of saving amount in 2009. However, this does not indicate poverty of farmers have increased. The savings is reduced due to inflation.

Table # 3.2 : Mean Monthly income, expenditure and savings of farmers during 2009 and 2013

Income, expenditure and savings (in Taka)	2009	2013	Gross increase in income. Expenditure and savings	% change in net savings
Farmers (n=430)				
• Household /family monthly income	8389	11595	3206	
• Respondent's monthly income	6613	7981	1368	
• Respondent's monthly expenditure	6139	9798	3659	
Net savings of farmers:	2250	1797	-453	-20.13

The table # 3.3 below shows that fishermen's household monthly income as well as expenditure have increased in 2013 in comparison with those of 2009. The savings of fishermen in 2013 has appeared to be slightly higher than that of saving amount in 2009. This may be due to some of the fishermen's household income earning might have higher during 2013 which might have been due to alternative income of fishermen during off season/dry season when they find some extra sources of income and their expending might have been lesser in proportion to their increased household income as well and expending might have been lesser in proportion to their household income.

Table # 3.3 :Mean Monthly income, expenditure and savings of fishers during 2009 and 2013

Income and expenditure and savings (in Taka)	2009	2013	Gross increase in income. Expenditure and savings	% change in net savings
Fishers/fish farmers: (n=50) (in taka)				
• Household /family monthly income	10070	12610	2540	
• Respondent's monthly income	8620	9726	1106	
• Respondent's monthly expenditure	6962	8672	1710	
Net savings of fishers/fish farmers:	3108	3938	830	26.71

The table # 3.4 below shows that boatman's household monthly income as well as expenditure have increased in 2013 in comparison with those of 2009. The saving of boatman in 2013 has become slightly lesser than that of saving amount in 2009. This may be due to boatmen have to switch to alternative job during dry seasons (4 to 5 months) such as wage laborer for agriculture, small vegetable trading, going to the town for odd job and irregular jobs on daily basis as well. As such whatever they earned during dray season when the survey was conducted are usually spent on going to far off places.

Table # 3.4 : Mean Monthly income, expenditure and savings of boatman during 2009 and 2013

Income and expenditure (in Taka)	**2009**	**2013**	**Gross increase in income. Expenditure and savings**	**% change in net savings**
Boatman: (n=50) (in taka)				
• Household /family monthly income	9990	10940	950	
• Respondent's monthly income	7370	8588	1218	
• Respondent's monthly expenditure	7048	8656	1608	
Net savings of boatman:	2942	2284	-658	-22.37

The table # 3.5 below shows that sand traders' household monthly income as well as expenditure have increased in 2013 in comparison with those of 2009. The savings of sand traders in 2013 has appeared to be slightly higher than that of saving amount in 2009. From survey and discussion with local community- it was known only sand traders are always better off than those of other respondents interviewed under this survey. The effect of Gorai restoration has neither benefited nor made any losses in terms of their earning income.

Table# 3.5 Mean Monthly income, expenditure and savings of sand traders during 2009 and 2013

Income and expenditure (in Taka)	**2009**	**2013**	**Gross increase in income. Expenditure and savings**	**% change in net savings**
Sand traders: (n=170) (in Taka)				
• Household /family monthly income	20105	25100	4995	
• Respondent's monthly income	16744	22212	5468	
• Respondent's monthly expenditure	11597	15819	4222	
Net savings of sand traders/helpers:	8508	9281	773	9.09

In sum it may be concluded that income and expenditure of all type of respondents of increased during project period in context to the starting period of project 2009. This is an indication of slightly better off position of all the type of respondents in context to 2009. But proportion of savings of farmers and boatman have reduced slightly in comparison to 2009 which are only -20.13 and -22.37 respectively. However, all these increased earning or expending by respondents do not indicate that they are very better off in 2013 than what they were in 2009.

Table # 3.6 below shows that majority of the respondents (69%) have school going children and rest of the household who have no school going children at present get some financial supports in the form of assistance to their works and through their own works at different places.

Table # 3.6 : Educational Status of children of the respondents

Whether children go to school/college (n=700)	Number	%
• Yes	483	69.0
• No	217	31.0
If no, what the children do/are involved with (n=217)		
• Assist parents in their works	80	38.6
• Works in different places	93	44.9
• Does nothing	34	16.4

3.3 Salinity of Water:

One of the objectives of this evaluation study was to assess whether the restoration of Gorai river had impacted in reducing the salinity of ground water available in the adjoining areas of river Gorai. The table # 3.7 below shows that during survey most of the respondents with exception of 4 persons stated about non availability of salt in the water and so loss of crop production and related problems are almost zero in the Gorai river areas. So, any positive impact of restoration of Gorai river on reduction of salinity does not arise.

Table # 3.7 : Information related to Salinity of Water

A.	Presence of saline in the drinking water (n=700)	Number	%
	• Yes (slightly salted)	4	.4
	• No	696	99.6
B.	Presence of saline in the water of Gorai river		
	• Yes	2	.3
	• No	698	99.7
C.	Process of detecting the salinity in the water:		
	• Slightly tasted while drinking	4	.4
	• Not need to taste as no salinity is traced	696	99.6
D.	Any health problems faced due to intake of saline water		
	• No symptoms observed	4	.4
	• Not applicable because no presence of salt in the water	696	99.6
E.	Any problem faced in crop production due to use of saline water		
	• No problems faced	700	100.0

Table # 3.8 below shows 99.0% of the respondents use tube well water for their drinking and domestic cleaning and only 7 respondents were compelled to take water from Gorai and ponds and canals due to lack of sources of water from tube well.

Table # 3.8 : Sources of water used for drinking and other day to day domestic purposes.

	Sources of water	Number	%
	• Water of Gorai river	4	.6
	• Water from Tubewell	693	99.0
	• Water from ponds and canals	3	.4
	• Water from earthen well	-	-

3.4 Availability of ground water:

Table # 3.9 above shows that due to restoration of Gorai river, availability of water in the tube well in dry season during 2013, has increased as stated by respondents (87.0%) of the respondents while 80.4% of the respondents stated about increased availability of water in tube well in 2009. This is an indication that restoration of Gorai river has to some extent heightened the ground water level and thus may be concluded that restoration of Gorai river has some positive impact on raising level of ground water in the adjoining areas of Gorai river.

Table # 3.9 : Availability of water in the tube well

A.	Availability of water in the tube well during dry season(2013):	Number	%
	• Yes	609	87.0
	• No	91	13.0
B.	Availability of water in the tube well before 2009 dry season		
	• Yes	563	80.4
	• No	137	19.6

3.5 Employment opportunity:

Table # 3.10 below shows that some as many as 43.3 % of the respondents have stated about increase in job opportunity and 50.4 % job availability is almost same as before. Job opportunity has slightly reduced as stated by 6.3% which may due to difficulty of sand lifting in during more water flow in river due to dredging. The reasons for both increase and decrease in job opportunity are more availability of sand at river side, more scope of cropping intensity in a year and sometimes difficulty to lift sand due to dredging of river etc.

Table # 3.10 : Job opportunity due to dredging of Gorai and reasons for increase and decrease in job opportunity.

Job opportunity due to dredging of Gorai river till 2013	Number	%
• Has increased	303	43.3
• Same as before	353	50.4
• Has decreased	44	6.3
Reasons for increase and decrease in job opportunity:		
• More availability of sand at river side	160	22.86
• Difficult to lift sand due to more water in river	56	8.00
• Production of multiple crops in a year.	514	73.43
• Income increased and decreased due to dredging	24	3.43

(Multiple response)

3.6 Proper use of dredged out sand:

Table # 3.11 shows 40.3% of respondents stated dredged out sand should be dumped by the river side but majority of the respondents said it should be dumped besides other canals or road side or in some far off side of the river . In indicates their awareness about proper place to dump the sand.

Table# 3.11: Dredged out sand and proper place for dumping of dredged out sand

	Number	%
Where has the dredged out sand thrown/dumped		
• Besides the river/next to the river side	417	59.6
• Dumping on the ditch besides the river	65	9.3
• Far off the river side	218	31.1
Preferred place for throwing/dumping of dredged out sand		
• By river side	282	40.3
• Dumping besides other canals and road side.	287	41.0
• Far off the river side	131	18.3

The table # 3.12 below shows some as many as 46.9 % of the respondents were interested to use dredged out sand for own work or fill up low land. And out of 328 only 197 (60.1%) asked for sand and out of 197 only 88(43.6%) received/got sand as per their request. Out of 88 respondents 55(58.5%) had to pay for sand and payment for was tk. 100- tk. 300 per truck. The reasons for not giving sand was due to complicacy of official formalities of BWDB in spite of respondent's unwillingness to pay for the dredged earth. The table also shows that most of the respondents (74.0%) are not interested to let their land dumped with dredged out sand.

Table # 3.12 : Use status of the sand by the respondents

	Number	%
Whether could dump on any place on embankment /river side		
• Yes	490	70.0
• No	210	30.0
Whether interested to use this sand for your own work or fill up any low land		
• Yes	328	46.9
• No	372	53.1
If yes, whether asked for this sand from POUB office (n=328)		
• Yes	197	60.1
• No	131	39.9
If yes, whether got the sand after your request (n=197)		
• Yes	88	43.6
• No	114	56.4
If yes, whether you had to pay someone for this sand (n=88)		
• Yes	55	58.5
• No	33	41.5
If yes, how much you had to pay to the authority (n=55)		
• Tk per truck	Tk 100- tk. 300	
If sand not given, reasons for not providing the sand (n=114)		
• They did not give due to official problems	67	58.77
• Because of not willing to pay as they wanted	32	28.07
• No specific reason	15	13.16
Peoples' willingness to give land besides the river to dump sand on embankment or on the side of the river :		
• Yes	182	26.0
• No	518	74.0

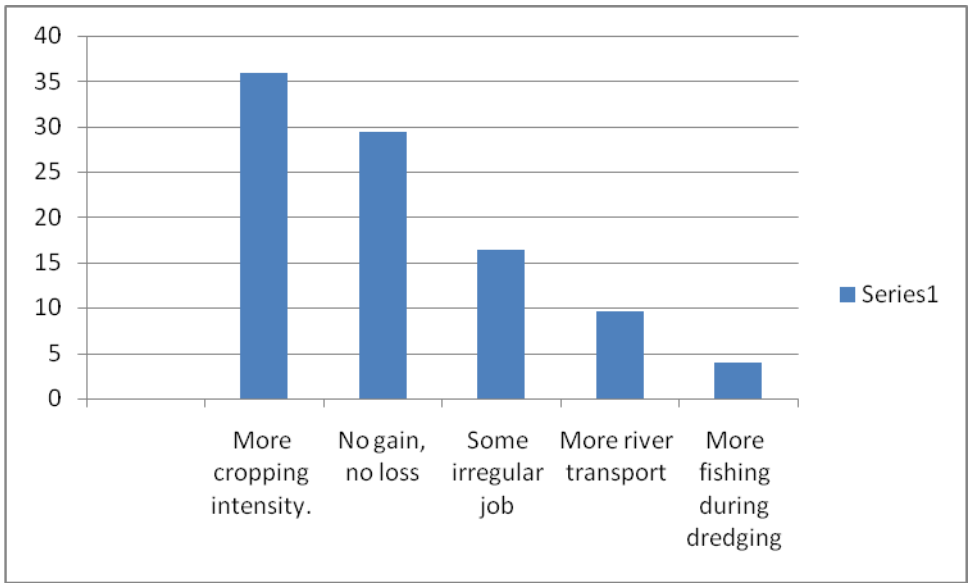
3.7 Benefits of project to the community:

The table # 3.13 below shows that as many as 36.0% of respondents stated to have been benefited due to opportunity for production of multiple crops, some gain in income earning and jobs though not regular, and 9.6 of the respondents due to increased flow of water at times of dredging helped more plying of river transports-boats, burge, launch etc. However, as many as 29.4% of the respondents said to have neither any gain or any loss from restoration of Gorai river.

Table #3.13 : Opinion about benefits accrued to the community due to project activities

	Number	%
Benefits of the project (n=700)		
• More opportunity of production of multiple crops in a year.	251	35.9
• Non response (neither benefited nor affected as far off from river side	206	29.4
• Some gains and more jobs though not regular	115	16.4
• Plying of riverine transports increased	67	9.6
• More water and more fishes were available during dredging	28	4.0

Chart # 3.1 : Benefits accrued to the community due to project activities.



The table # 3.14 below shows that as many as 72.1% of respondents stated to have been neither much benefited nor much gained from this project activities. Some of the respondents also said that many sides of the embankment of Gorai had collapsed/eroded due to project activities. More than one fourth of the respondents stated many agricultural lands, crops and houses are damaged due to unplanned embankment and dredging.

Table # 3.14 : Difficulties faced due to project activities

Type of Difficulties faced (n=700)	Number	%
• Many sides of the embankment of Gorai river had collapsed/eroded due to project.	16	2.3
• Land, crops and houses of river side people were damaged	179	25.6
• Neither much benefits nor much gain had occurred	505	72.1

3.8 Status of farmers

Table # 3.15 : Present condition of Agriculturist/farmers

Present condition (n=430)	Number	%
• The farmer cultivate his own plot of land	266	61.9
• Gives his own land for share-cropping or lease	38	8.8
• Works as share-cropper	98	22.8
• Works as a landless farmer	24	6.5

Table # 3.16 : Sources of water for irrigation of agro-crops/production

Sources of water (n=430)	Number	%
• Brings water through LLP from Gorai river	9	2.1
• Brings water from GK project for irrigation	70	16.3
• Brings water from tube well for irrigation	47	10.9
• Other sources (ponds/canals etc)	280	65.1
• No use of water	24	5.6

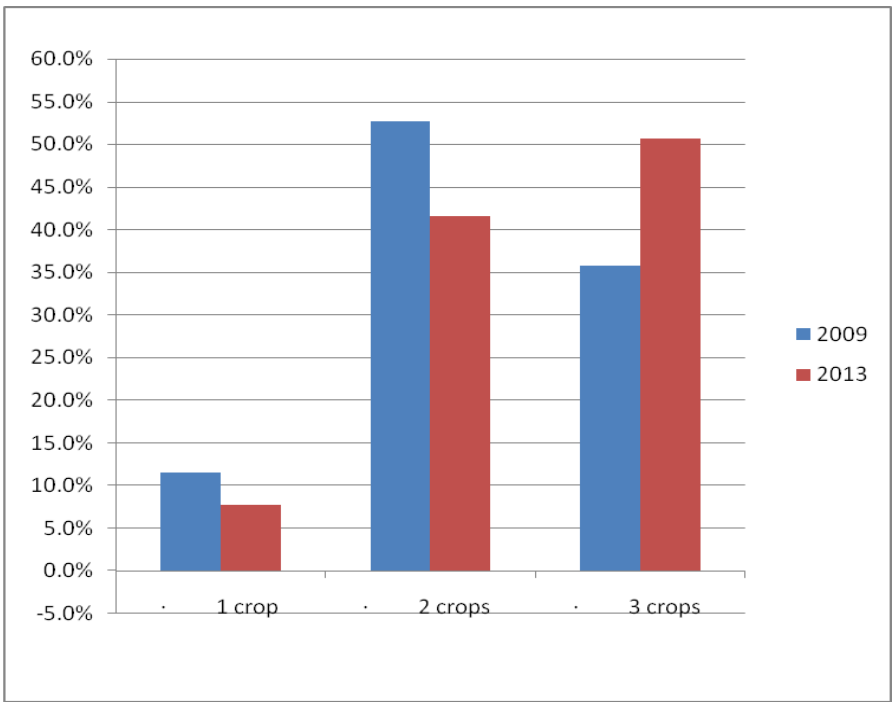
3.9 Cropping intensity:

Table# 3.16 shows that during 2009, 11.5% of the used to produce one crop while during 2013 and onward 7.7% of the farmers stated to have produce one crop followed 52.7% of the farmers stated to have produced two crops while 41.6% of the farmers now in 2013 produce 2 crops. Previously in 2009 35.8% of the farmers used to produce three crops while during 2013 , 50.7% of the farmers stated to produce three crops. So, it appears that some of the farmers who used to produce to one crop have now shifted to production of two crops and those who used to produce two crops from them- some number of farmers shifted towards production of three crops. This is an indication of opportunity for increased cropping intensity which may be related more flow of water in Gorai river during dredging as well as slightly increased level of ground water during dry season.

Table # 3.16 : Number of crops produced during the years 2009 and 2013

Number of crops (n=430)	2009	2013
• 1 crop	11.5 %	7.7 %
• 2 crops	52.7 %	41.6 %
• 3 crops	35.8 %	50.7%

Figure 3.2 # : Cropping intensity during 2009 and 2013



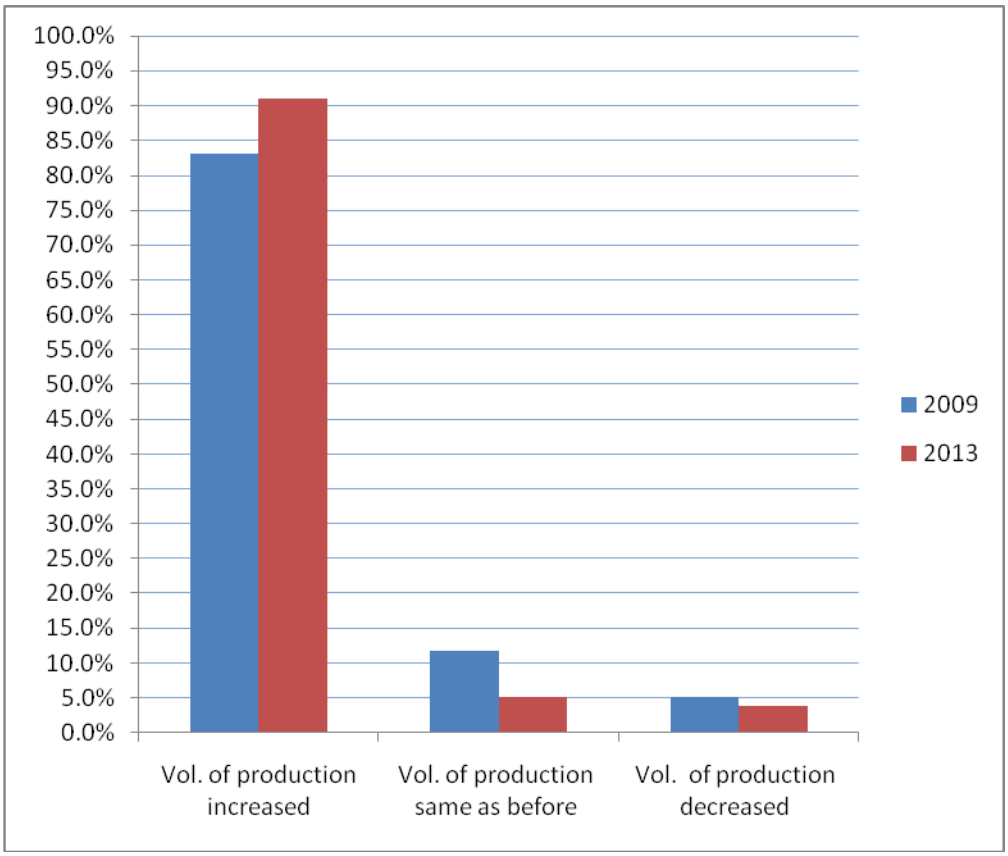
3.10 Volume of productivity:

The table# 3.17 shows that 91.0% of the farmers have stated that volume of production of crops increased in 2013 when 83.1% of the farmers stated about increased volume of production in 2009. This is an indirect impact of project activities as cropping intensity increased due to more flow of water and so also the volume of production of crops although the increase is very slight.

Table # 3.17 : Volume of production increased/same as /decreased as stated by farmers during 2009 and 2013

Status of production (n=430)	2009	2013
• Vol. of production increased	83.1%	91.0%
• Vol. of production same as before	11.7%	05.2%
• Vol. of production decreased	05.2%	03.8%

Figure # 3.3 : Vol. of production increased/same/decreased



3.11 Reasons for increase/decrease in the production of crops

The table # 18 below shows that reasons for increase and decrease in the production of crops are not directly attributed due to project activities. 46.05% of the farmers stated about increased supply of water during dredging period only and 29.07% of the farmers stated more use of improved seeds and fertilizers helped increase production which is beyond the effect of project activities. As many as 30.7% of the farmers stated that despite project activities, flow of water did not increase in dry season which to some extent reduced volume of production of crops in dry season.

Table#18 : Reasons for increase/decrease in the production of crops.

Reasons for increase/decrease in production	Number	%
• Increased supply of water during dredging only	198	46.05
• More use of improved seeds and fertilizer	125	29.07
• At times lesser flow of water in river during dry season	132	30.70

(Multiple response)

3.12 Navigability of rivers:

Table # 3.19 shows that 88.0% of the boatman feel that water flow does not remain in Gorai during dry season, although it was expected that project activities would increase water flow to some extent. Only 22.0% of the boatman felt that navigability of river increased slightly due to dredging. However, the water flow in Gorai river depends not only on dredging but also due to rain and extent of water flow from India during dry season.

Table # 3.19 : Shows Information related to water flow, increased navigability and employment of boatman

	Number	%
Whether water flow remains in Gorai river during dry season(2013)		
• Yes	6	12.0
• No	44	88.0
If no, how people crossed the river during dry season		
• Dingy boat	4	8.0
• On foot	46	92.0
• On bamboo made bridge/crossing	-	-
Reasons for crossing the river on foot (n=46)		
• River becomes dry and filled with sand	44	95.7
• Mechanical transport can not ply on dry river bed	2	4.3
Navigability of river transports in Gorai river during dry season		
• Yes	11	22.0
• No	39	88.0
Employment for boatman due to increased flow of water during dry season		
• Employment opportunity has increased	17	34.0
• Employment has remained the same	27	54.0
• Has decreased	6	12.0

Findings from Survey/ interview with Sand traders:

3.13 Volume of sand lifting

The table # 3.20 below shows that majority of sand traders (80.0%) have stated that volume of sand lifting increased in dry season and reason for increased sand lifting is due to the reason that Gorai river becomes dry and filled with sand during dry season.

Table# 3.20 : Volume of sand lifting and reasons for increase or decrease of sand lifting

(n=170)	Number	%
Volume of sand lifting from Gorai river during dry season(2013)		
• Has increased	136	80.0
• Same as before	30	16.7
• Has decreased	04	2.4
Reasons for increase/decrease in sand dredging		
• River becomes dry and filled with sand	113	66.47
• More sand available in one place due to dredging	53	31.18
• Others	04	2.35

Table : Use of transports and reasons for increase or decrease use of transport

Use of transport for carrying sand from Gorai river during dry season (2013) (n=170)		
• Has increased	149	87.6
• Same as before	21	12.4
• Has decreased	-	-
Reasons for increase/decrease use of transport for carrying sand		
• More availability of sand- so more need for transports	152	89.41
• Improved roads in some places but lack of adequate transports	19	11.18

3.14 Employment opportunity of sand traders:

The table # 3.2 below shows that majority of the sand traders stated that employment opportunity has increased and reasons for increased employment are more availability of sand on river side and involvement of more people/helpers for increased wage.

Table # 3.21 : Employability for sand traders and reasons for increase or decrease

Employment for sand traders/helpers due to more dredged out sand from Gorai river (n=170)	Number	%
• Employment opportunity has increased	122	71.8
• Employment has remained the same	46	27.1
• Employment has decreased	2	1.2
Reasons for increase/decrease in employment for sand lifting (n=170)		
• More availability of sand on river side	142	83.53
• More people/more wages for lifting of sand from river	26	15.29
• Due to increase flow of water	2	1.18

The table # 3.22 below shows that majority of sand traders (70.0%) observed that scope of more employment in transports generated and the reason for more employment in transports are more availability of sand and more demand for sand transport and labour. Table# 3.22 Scope of employment in sand transport and reasons for increase and decrease

Scope of employment in transport for carrying sand from Gorai river (n=170)		
• Has increased	119	70.0
• Same as before	45	26.5
• Has decreased	6	3.5
Reasons for increase/decrease in employment for sand-transport. (n=170)		
• More availability of sand and more demand for sand transport and labour	167	98.2
• Short of labour/loaders/helpers for loading/unloading sand	3	1.8

3.15 Reasons for increase/decrease in income earning of respondents:

The table # 3.23 below describes the major reasons for increased or decreased income earning of various group of respondents. In reality, the project activities did not impact equally on respondents –some were benefited and some were not at all benefited. It was almost same as before 2009. Majority of the farmers (51.4%) felt that their income earning increased due to more flow of water and also due to more cropping intensity etc. And production also hampered due to lesser flow of water in dry although it was expected that due to dredging the water flow in Gorai would increase. But, in reality the situation was reverse and not what was expected.

The fishermen stated that more fishes were available in the Gorai river due to dredging but when dredging stopped, the water flow reduced and so also volume of fish production. As such during dry season, they had to switch to other job for their subsistence. The boatmen had increased income during dredging when water flow in the river increased and as such they could ply their boats more frequently and could earn income. But due to lesser flow of water in dry season, their income from boating is reduced to zero and during the dry season they have to seek for alternative jobs- such as agriculture laboring, rickshaw pulling in the district towns and small trading etc. So, they have a notion that the dredging of Gorai river has not much benefited since water flow remains for a short period of time. The table shows that sand traders were the only respondents who are mostly benefited due to availability of sand during dry season. So,

increased flow of water, dredging and embankment have nothing to add much to their increased income earning.

Table # 3.23 : Reasons for increase/decrease in income earning of respondents

Farmers : (n=430)	Number	%
• More production of crops due to more flow of water during dredging and embankment.	221	51.40
• More cropping intensity lead to more agro labours and wages	39	9.07
• More use of seeds, fertilizer, irrigation etc.	24	5.58
• Production hampered due to lesser flow of water in dry season	176	40.93
Fishers/fish farmers: (n=50)		
• Availability of more fishes due to dredging	21	42.00
• Less amount of fish due to lesser amount of water	19	38.00
• During project more water and more fishes were available	14	28.00
Boatman: (n=50)		
• Increased fare for use of boat as transport	16	32.00
• Less income in dry season due lesser use of boat	27	54.00
• More income in rainy season due to more use of boat	18	36.00
Sand traders/helpers: (n=170)		
• More availability of sand in dry season so more income	123	72.35
• Increased wage and increased supply of workers	25	14.71
• Increase of transport and increase of income	17	10.00
• When more water lesser amount of sand available	45	26.47

(multiple responses)

According to most of the fishers, the restoration of Gorai river has not improved the flow of water during dry season in 2013 when compared with flow of water in 2009. So, virtually, restoration of Gorai has not improved their situation as was expected.

So, also the navigability of Gorai river has not increased at all in dry season , it rather remained more or less the same, even some of the boatmen and fishermen stated that the water flow reduced which to some extent affected their income earning from boating and fishing. However, during this dry season or lesser flow of water, fishermen usually seek some other alternative means of earning which are small trading, rickshaw pulling, some doing business, sand lifting and agro laboring etc. So, through this type of temporary job switching , they can earn some money for their subsistence.

3.16 Environmental problems/destruction:

Although it was expected that due to embankment along Gorai river would help protect adjoining areas of river Gorai from flooding and erosion but in reality the scenario was not positive. As many as 30% of the respondents stated due to faulty and unplanned embankment much of their crop lands, livestock, ponds and houses are damaged due to erosion and flooding. So, construction of embankment along Gorai river has not improved the situation as it was before 2009.

3.17 Cost of river transports :

With respect to cost of river transport, during dry season, it was observed and also stated by people that restoration of Gorai river did not increase the water flow rather it remained almost same as before the dry season in 2008. So, the movement of water transport did not improve at all as was expected from project activities.

3.18 Rural employment and poverty :

Rural employment increased for some people who are involved in sand trading/business. But for boatmen and fishermen, employment in dry season remained almost what was during dry season of 2009. As such their earning and livelihood have not improved in context to their main occupation. Their income earning during dry season was from alternative temporary usually came from fish trading, farming in others land, rickshaw pulling and in construction works in near towns and cities etc. So, except for few people, the poverty situation of the people in general did not improve as was expected from project activities.

Table: Information related to Fishers/fisherman

	Number	%
Employment opportunity in fishing after 2009 when water flow increased in Gorai during dry season.		
• Has increased	25	50.0
• Same as before	13	26.0
• Has decreased	12	24.0
Reasons for increase/decrease in employment in fishing		
• Increased employment in fish production due to increased water flow in Gorai	32	64.00
• Sometimes lesser flow of water and at times overflow/flooding of water	18	36.00
Volume of fish production after 2009 in Gorai		
• Has increased	20	40.0
• Has decreased	30	60.0
Volume of fish production after 2013 in Gorai		
• Has increased	15	30.0
• Has decreased	35	70.0
Reasons for increase/decrease in fish production		
• Increased production of fish due to increased water flow in Gorai	23	46.0
• Lesser flow of water	27	54.0

Chapter 4

Observations

4.1. Site visit by the Consultant:-

The Consultant visited the Project Site at Kushtia. During site visit, he observed the changes that have occurred in the morphological condition of the Gorai river. The river was almost totally silted up with traces of shallow water channel across the char area and there was no water or flow in the river as the off take of Gorai from Ganges at Talbaria was blocked due to siltation. The sections which were dredged in the previous years were so silted up that there was no trace of them. Two dredgers at different locations were seen engaged in dredging. One named Padma was working near the off-take of Gorai from Ganges at Talbaria. The off-take was blocked and discontinued from Ganges due to total siltation. The dredger was dredging from the off-take towards downstream. Another dredger named Gorai was seen dredging near the Kushtia town- which is almost 5km from Talbaria. The program is such that two dredged sections will meet at a point when they will be linked up & the water from Ganges will start flowing through Gorai. The Executive Engineer who was present during the site visit was telling that these are the dredgers which have been procured under the project. He told that the dredging program during this year is 14.5 km from off-take to downstream at Kumarkhali. He was also telling that they were follow thing the alignment as per suggestion of IWM made on the basis of mathematical model results. The Executive Engineers (Civil & Mechanical) IWM representative were present at the site during the inspection.

The Consultant also went to Kumarkhali and Khoksha to see the condition of the Gorai and found it almost same as that in Kushtia. The Consultant talked to the local beneficiaries and wanted to know about the Project activities and their livelihood. They replied that they would be benefited if the project is implemented. But some were telling that they think the erosion was due to dredging. The consultant also discussed with the field staff who were interviewing the beneficiaries and collecting replies to questionnaire prepared for them and enquired whether they were facing any problem. They replied in the negative.

Photo No.2 Dredger has been set for dredging

Photo No. 1 Condition of Gorai before Dredging

4.1.1 Taking measurement by IWM and specification of dredging work:-

- The Consultant discussed with the IWM representative regarding the pre work measurement. He told that the program of this year is about 14.5 km from the off-take at Talbaria, Kushtia to Kumarkhali. He told that segment-wise pre work measurement was taken before starting of dredging on that segment and the measurement was done by Bathymetry survey using Echo-sounder and Total Station. He was telling that the measurement would be jointly signed by IWM, representative of the Executive Engineer, Gorai River Restoration Project, Phase-II and representative of Task Force of BWDB coming from Dhaka.

  The Consultant attended such measurement on 12-02-2014. The Reduced Level of the Char within the alignment was found to be 5.5 m to 6 m PWD. The depth of the dredged cutting was found to be 3 m from the water level to the bed level by sounding method.

- The Consultant wanted to know the specification of the Dredging work. The representative of IWM replied that the bed width is 30 m and the side slopes are 1:3 on both sides. This time, the Consultant again wanted to know how the geometric section of the work is attained by the dredger. The representative explained the working procedure of dredging which is given below:

  The dredger moves along the center line of the alignment. The cutter is placed at the center line and is moved towards right and left of it perpendicularly up to 15 m. They dredge the layer of depth 1 m and move from the center line to the end of this 15 m. When the bed level reaches the design level of 2 m, the side slope automatically takes near the specification due to sliding of soil as the cutting edge can not remain vertical. The geometric section may not be attained exactly but it comes to the nearer. The volume of dredged earth is calculated on the basis of pre work and post work of the dredged section but it will not be more than that of geometric section.

Photo No. 3 Dredger is in operation

Photo No. 4 Survey is being done by IWM

4.1.2. Disposal of spoil

During the discussion, the Executive Engineer (Civil) was telling that the dredged spoil earth was being dumped at suitable locations such as sometimes near the embankment, sometimes a bit away from the alignment and priority is given on filling the lower points by the soil. He told that temporary Protection Works is being done at four points on the left Afterward the consultant went to Khulna. He went to the office of Khulna WASA & discussed with the Deputy Managing Director regarding water supply of Khulna city and salinity of water. The DMD gave a brief description of water supply for the Khulna City by WASA. He informed that ground water is being used for the water supply and its salinity is within acceptable limit i.e. less than 1ppt. He was telling that Khulna WASA has submitted different proposal and prepared DPP using surface water as source which are awaiting approval by the Competent Authority. When asked by the consultant regarding the salinity of drinking water beyond Khulna city area, the DMD replied that DPHE (Directorate of Public Health Engineering) is looking into it. Regarding salinity of water in these area, he replied that so far he knew the salinity varies from area to area and it was much more than 1 ppt though he had no data. He told that DPHE has different Projects there for making it suitable for the drinking purposes. The consultant also went to the office of the forest department afterwards and discussed with the divisional forest officer, Sundarbans Reserved Forest (West) regarding the salinity of rivers and water ways around Sundarbans and wanted to know from him whether they have any monitoring system of water sample collection data and finding out its salinity value. The Divisional Forest Officer replied that they have no such monitoring system and they contact IWM for this purpose as and when they need it.

Later on the consultant went to the office of BWDB, Khulna, discussed with the Sub-Divisional Engineer, BWDB, Hydrology, Khulna regarding the salinity of rivers around Khulna and the Sundarbans. The SDE replied that salinity has increased in the rivers during this year and he has sent the data to Head Office of Hydrology, BWDB at Dhaka for processing.

- On return from Khulna the consultant contacted the hydrology office of BWDB at Dhaka and discussed with the System Analyst. Some salinity data for Khulna station has been collected from him. The data has been analyzed and it is observed that the salinity of Khulna is almost similar to that as found out by IWM.
- From the discussion with DMD, Khulna WASA and DFO, Sundarban it was evident that they are not informed of the project though they are involved with it.

4.2 Physical and Financial Progress

ToR no.1 To review the implementation status of major components of the project (financial & physical)

The latest progress report submitted by the project director up to April 2014 has been taken as the basis of observation (Enclosure 1). Total cost of project is 94217.55 lakh taka and the expenditure up to April 2014 is Tk. 48215.28 lacs. So the physical progress is 56.82% and financial progress is 51.17%. It is seen that total no. of components of works are 20. The physical and financial progress of the important components is given below:

Sl. No.	Work components as per PP (with quantity)	Estimated cost	Achievement up to last June		Target of the current year		Progress up to the month of April, 2014	
			Financial	Physical (% of the component)	Financial	Physical (% of the component)	Financial	Physical (% of the component)
	Revenue component							
1	Bathymetric survey for pre-work and post-work measurement (1 item)	378.00	345.91	100.00	31.11	8.23	7.78	6.00
2	Morphological Mathematical Modelling (1 item)	450.00	229.84	90.00	51.60	11.5	12.90	7.00
3	Procurement Specialist (24 mm)	24.00	4.95					
4	Plan form Study adjacent to Gorai off-take	150.00						
5	Training (1 item)	300.00	297.34	100				
	Capital component							
1	Purchase of Dredger and Ancillary Equipments (2 sets)	23400.00	22960.67	98.00				
2	Capital Dredging of Gorai River by International Contractor (93 lakh cum)	15810.00	11954.70	100%				
3	Construction of Flow Divider	15000.00						
4	Construction of Guide Bundh	12000.00						

- **Guide Bundh, Flow Divider and Plan Form Study**

It is seen that the works of guide bundh, flow divider and plan from study have not yet been started or even been programmed during this financial year though this is the completion year of the project. The total cost of this three items 27150.00 lakh taka. The reasons for not taking upon these items have been given in para 4.7 and 4.8. If the cost of this three items were deducted from the total cost of the project, the progress of work would have been much higher.

- **Procurement Specialties**

One Procurement Specialist was engaged under the Project to assist the Project Director in the Procurement. But it is seen that he has been relieved of his contractual obligation before the Procurement of 2 sets of dredgers and settlement of issues relating to their acceptance. Hence it is not understood what input he has given to assist the Project Director. Detail information have been furnished in para 4.3.6 of the Main Report.

- **Capital Dredging**

The contract price of Capital Dredging and 1st year Maintenance Dredging by outsourcing was Tk. 205.53 crore. It has been completed at Tk. 203.05 crore. Progress is 100%.

- **Training**

- The DPP allocation for this component was Tk. 300 lacs. The progress of the component is 100% and the total expenditure has been spent. It is seen that in 02 (two) batches the training program were done. The number of participants in first batch is 15 and in second batch is 13. The detailed information's regarding the training programmes are furnished below:

- Detailed description of Foreign Training conducted under Gorai River Restoration Project, Phase-II in the financial year 2011-12

-

A. Place of visit: Natherland
B. Purpose of visit: Training on Planning, Monitoring and Evaluation of Capital Dredging on Gorai River Restoration Project Phase-II
C. Date of visit: From 14th to 18th November, 2011.
D. Name & designation of the participants in the training:

1. **From BWDB**

1 Mr. Md. Abdul Baten, Project Director, Gorai River Restoration Project Phase-II, BWDB, Dhaka.
2 Mr. Md. Akmol Hossain, Director, Program, BWDB, Dhaka.
3 Mr. Md. Abdur Rahman Mondol, Executive Engineer, Gorai River Restoration Project Phase-II, BWDB, Dhaka.
4 Mr. Sayeed Ahmed, Executive Engineer, Gorai River Restoration Project Phase-II, BWDB, Dhaka.
5 Mr. Kallyan Dus, Executive Engineer, Gorai River Restoration Project Phase-II, BWDB, Dhaka.
6 Mr, Mollah Monzurul Hoque, Executive Engineer (Mechanical) Narayanganj Dredgers Division, BWDB, Narayanganj.
7 Mr. Khondokar Md. Monirul Islam, Executive Engineer (Mechanical), Design Circle-3, BWDB, Dhaka.
8 Mr. Kazi Tofael Hossain, Executive Engineer (Civil), Design Circle-2, BWDB, Dhaka.
9 Mr. Md. Abul Kalam Azad, Executive Engineer (Mechanical) Central Repairs Workshop Division, Mechanical Equipments Directorate, BWDB, Dhaka.
10. Mr. Md. Abul Quasem, Sub-divisional Engineer (Civil), Gorai River Restoration Project Phase-II, BWDB, Dhaka.

2. From MoWR,Planning Commission& IMED.

1. Mr. Md. Taslimul Islam, Deputy Secretary, Ministry of Water Resources, Bangladesh Secretariate, Dhaka.
2. Mr. Md. Ashraf Uddin, Senior Assistant Secretary, PS to the Secretary, Bangladesh Secretariate, Dhaka.
3. Mr. Abdul Azim Chowdhury, Deputy Chief, Planning Division, Sher-e-Bangla Nagar, Dhaka.
4. Mr. A.H.M. Kamruzzaman, Senior Assistant Secretary, Planning Division, Sher-eBangla Nagar, Dhaka..
5. Mr. Mumitur Rahman, Assistant Director, IMED, Ministry of Planning, Sher-e-bangla Nagar, Dhaka.

- The officers of BWDB have been included from its different offices. Sl No. 3 and 5 are still in the project. The remaining officers are learnt to have been posted in other offices of BWDB.
- The present posting of the officers of the Ministry are not known.

Detailed description of Foreign Training cond,,ucted under Gorai River Restoration Project, Phase-II in the financial year 2011-12

A. Place of visit: Natherland
B. Purpose of visit: Traning on River System Management
C. Date of visit: From 13th to 24th September, 2012.

D. Name & designation of the participants in the training:

1. From BWDB

1 Mr. Md. Mahtabuddin, Chief Engineer, Southern Zone, BWDB, Barisal.
2. Mr. Md. Abdul Baten, Project Director, Gorai River Restoration Project Phase-II, BWDB, Dhaka.
3. Mr. Md. Mozammel Hossain, Superintending Engineer, Design Circle-5, BWDB, Dhaka.
4. Mr. Abdul Mojid Mollah, Superintending Engineer, Faridpur O & M Circle, BWDB, Faridpur.
5. Mr. Abdur Razzaque Khan, Superintending Engineer, Processing Section, BWDB, Dhaka.
6. Mr. Md. Abdur Rahman Mondol, Executive Engineer, Gorai River Restoration Project Phase-II, BWDB, Dhaka.
7. Mr. A.K.Monzur Hasan, Executive Engineer, Design Circle-6, BWDB, Dhaka.
8. Mr. Md. Mahbub-ul-Kabir, Executive Engineer, Contract & Procurement Cell, BWDB, Dhaka.
9. Mr, Zahedur Rahman, Sub-divisional Engineer, Gorai River Restoration Project, Phase-II, BWDB, Dhaka.
10. Mrs. Rokhsana Begum, Sub-divisional Engineer (Civil), Office of the Chief Monitoring, BWDB, Dhaka.
11. Md. Mr. Abdullah Md. Mostafa Sorower, Sub-divisional Engineer, Gorai River Restoration Project Phase-II, BWDB, Dhaka.

2.From MoWR

1. Mr. Parimal Chandra Saha, Joint Secretary, Ministry of Water Resources, Bangladesh Secretariate, Dhaka.
2. Mr. Md. Ruhul Quddus, Joint Secretary, Ministry of Water Resources, Bangladesh Secretariate, Dhaka.

- The officers of BWDB have been included from its different offices. Only Sl No. 6 is still in the project. The remaining officers are learnt to have been retired or posted in other offices of BWDB.
- The present position of the officers who were nominated from MoWR, IMED & Planning Commission are not known.
- Total number of officers who have got training under the Project is 28 (Details in Enclosure-2). Total expenditure is Tk. 297.00 lacs against allocation of Tk. 300.00 lacs. The progress of Training component is 100%. The officers were nominated from BWDB, MoWR, IMED & Planning Commission. The officers who were nominated from BWDB were 10 out of 15 in the first batch and 10 out of 13 in the second batch. The no. of officers nominated by BWDB was 20. They were not all from the Project but from other Projects or other postings of BWDB. Their experience could not be utilized for the Project as they were never posted in the Project and by now some of them have gone on PRL or to other postings on promotion. Even who went from the Project have been posted to other place of postings. Now only one officer is working in the Project and the Project could not utilize the experience of the training program.

4.3 Procurement

ToR No. 2: To examine whether the procurement process (Invitation of tenders, evaluation, approval procedures, contract award etc.) of the packages (Goods, Works ans Services) under this Project was followed as per PPR 2008.

The Project contains so many procurements. They include all types of Procurement i.e. a) Procurement of Services, b) Procurement of Goods & c) Procurement of Works. Of them, the following procurements have been selected in consideration of their importance and studied case-wise:-

1. Procurement of Services:-
   (i) Institute of Water Modeling (IWM) for Bathymetric Survey.
   (ii) Institute of Water Modeling (IWM) for Mathematical Morphological Modeling.
   (iii) Procurement Specialist.

2. Procurement of Works:-
   (i) Dredging works by outsourcing for Capital Dredging and maintenance Dredging.
3. Procurement of Goods:-
   (i) Manufacturing and supply of 02 sets of dredgers.

4.3.1. Case Study-I

Procurement of Services for Bathymetric survey by IWM.

1	Implementing Agency	Bangladesh Water Development Board.
2	Name of The Project	Gorai River Restoration Project (Phase II)
3	Tendering Method	Single Source Selection (SSS)
4	Name of Work	Bathymetric Survey for Pre work and Post work measurement of Dredging.
5	Name of Daily Paper	N/A
6	Date of Selling of Tender	N/A
7	Last Date of Selling of Tender	N/A
8	Total No. of Tender Received	N/A
9	Date and Time of Opening of Tender	N/A
10	No. of Member of TOC present at the time of opening of Tender	N/A
11	Date and time of opening of Tender. If any member of the Tender Opening Committee (TOC) was present while opening tender documents?	N/A
12	No. of responsive tenders	N/A
13	No. of non-responsive tenders and reasons	N/A
14	No. of External Members in the Tender Evaluation Committee (TEC)	2 persons.
15	Date of meeting of TEC	02-05-2010
16	Date of approval of Minutes of meeting of the TEC	02-05-2010.
17	Date of preparation of Report of the TEC	02-05-2010.
18	Date of approval of the report of the TEC by the DG, BWDB(Post-Facto)	04-05-2010.
19	Date of Notification of Award	
20	Total Contract Price	Tk. 3.77 crore.
21	Date of Signing of Contract	November, 2009.
22	Date of Award of Contract	
23	Date of commencement of work	
24	No. of days of time extension, if any	
25	Date of completion of work	4 years.
26	Date of submission of final bill and its value	Not paid yet.
27	Date of Payment of Final Bill and its amount	Not paid yet.

28	TEC is as follows (applicable for Procurement of 2 packages for IWM and 1 package for Procurement Specialist). 1. Additional Director General (O & M 2), BWDB, Dhaka. 2. Dr. Professor Abdul Matin, Head, Department of Water Resources Engineering, Bangladesh university of Engineering & Technology, Dhaka. 3. Mr. Md. Afsar Ali, Senior System Analyst, BPDB Computer Centre, BPDB, Dhaka. 4. Executive Engineer, Dredging, Gorai River Restoration Project (Phase II), BWDB, Dhaka. 5. Executive Engineer, Contract & Procurement Cell, BWDB, Dhaka. 6. Project Director, Gorai River Restoration Project (Phase II), BWDB, Dhaka.	 Convener Member Member Member Member Member-Secretary.
29	Approving Authority	DG, BWDB

Comments:
The engagement of IWM for the package on Single Source Selection basis seems to be justified considering the technical expertise of the organization. As per clause no. 104 (1) (gha) (2) (e) of PPR-2008, the process is found to be in order.

4.3.2 Case Study-II
Procurement of Services for Mathematical Modelling by IWM.

1	Implementing Agency	Bangladesh Water Development Board.
2	Name of The Project	Gorai River Restoration Project(Phase II)
3	Tendering Method	Single Source Selection (SSS)
4	Name of Work	Mathematical Morphological Modelling
5	Name of Daily Paper	N/A
6	Date of Selling of Tender	N/A
7	Last Date of Selling of Tender	N/A
8	Total No. of Tender Received	N/A
9	Date and Time of Opening of Tender	N/A
10	No. of Member of TOC present at the time of opening of Tender	N/A
11	Date and time of opening of Tender. If any member of the Tender Opening Committee (TOC) was present while opening tender documents?	N/A
12	No. of responsive tenders	N/A
13	No. of non-responsive tenders and reasons	N/A
14	No. of External Members in the Tender Evaluation Committee (TEC)	2 persons.
15	Date of meeting of TEC	05-09-2010.
16	Date of approval of Minutes of meeting of the TEC	05-09-2010.
17	Date of preparation of Report of the TEC	05-09-2010.
18	Date of approval of the report of the TEC by DG, BWDB.	15-09-2010.
19	Date of Notification of Award	
20	Total Contract Price	
21	Date of Signing of Contract	
22	Date of Award of Contract	
23	Date of commencement of work	
24	No. of days of time extension, if any	
25	Date of completion of work	4 years.
26	Date of submission of final bill and its value	Not paid yet.
27	Date of Payment of Final Bill and its amount	Not paid yet.

28	TEC is as follows (applicable for Procurement of 2 packages for IWM and 1 package for Procurement Specialist). 1. Additional Director General (O & M 2), BWDB, Dhaka. 2. Dr. Professor Abdul Matin, Head, Department of Water Resources Engineering, Bangladesh university of Engineering & Technology, Dhaka. 3. Mr. Md. Afsar Ali, Senior System Analyst, BPDB Computer Centre, BPDB, Dhaka. 4. Executive Engineer, Dredging, Gorai River Restoration Project (Phase II), BWDB, Dhaka. 5. Executive Engineer, Contract & Procurement Cell, BWDB, Dhaka. 6. Project Director, Gorai River Restoration Project (Phase II), BWDB, Dhaka.	 Convener Member Member Member Member-Secretary
29	Approving Authority	DG, BWDB

Comments:
The engagement of IWM for the package on Single Source Selection basis seems to be justified considering the technical expertise of the organization. As per clause no. 104 (1) (gha) (2) (e) of PPR-2008, the process is found to be in order.

4.3.3 Case Study-III
Procurement of Services for Procurement Specialist

	Procurement Specialist	
1	Implementing Agency	Bangladesh Water Development Board (BWDB)
2	Name of the Project	Gorai River Restortion Project,(Phase-II)
3	Tendering method	Single Source Selection (SSS)
4	Name of works as per Tender	-N/A-
5	Name of the Daily News Paper where Tender was invited	-N/A-
6	Date of starting of Selling of Tender Documents	-N/A-
7	Last date and time of selling of Tender Documents	-N/A-
8	Last date and time of receiving of Tender Documents	-N/A-
9	Total No. of Tenders received	-N/A-
10	Date and time of opening of Tender. If any member of the Tender Opening Committee (TOC) was present while opening tender documents?	-N/A-
11	No. of Member of TOC present at the time of opening of Tender	-N/A-
12	No. of responsive tenders	-N/A-
13	No. of non-responsive tenders and reasons	-N/A-
14	No. of External Members in the Tender Evaluation Committee (TEC)	2 nos.
15	Date of meeting of TEC	16-02-2010
16	Date of approval of Minutes of meeting of the TEC	16-02-2010.
17	Date of preparation of Report of the TEC	16-02-2010.
18	Date of approval of the report of the TEC by DG, BWDB	18-02-2010.
19	Date of Notification of Award	
20	Total Contract Price	Tk. 4.95 lakhs.
21	Date of Signing of Contract	18-02-2010.
22	Date of Award of Contract	18-02-2010.
23	Date of commencement of work	18-02-2010.
24	No. of days of time extension, if any	Did not arise.
25	Date of completion of work	31-12-2010 (Total 5 months)
26	Date of submission of final bill and its value	
27	Date of Payment of Final Bill and its amount	

28	TEC is as follows (applicable for Procurement of 2 packages for IWM and 1 package for Procurement Specialist). 1. Additional Director General (O & M 2), BWDB, Dhaka. 2. Dr. Professor Abdul Matin, Head, Department of Water Resources Engineering, Bangladesh university of Engineering & Technology, Dhaka. 3. Mr. Md. Afsar Ali, Senior System Analyst, BPDB Computer Centre, BPDB, Dhaka. 4. Executive Engineer, Dredging, Gorai River Restoration Project (Phase II), BWDB, Dhaka. 5. Executive Engineer, Contract & Procurement Cell, BWDB, Dhaka. 6. Project Director, Gorai River Restoration Project (Phase II), BWDB, Dhaka.	 Convener Member Member Member Member Member-Secretary
29	Approving Authority	DG, BWDB

Comments:
Engagement of Procurement Specialist on Single Source Selection basis seems not to be justified. It should have been selected as per clause no. 112(2) of PPR 2008.

4.3.4 Case Study-IV

Procurement of Dredging by International outsourcing :

	Dredging work by outsourcing	
	A. For pre-qualification	
1	Implementing Agency	Bangladesh Water Development Board (BWDB)
2	Name of the Project	Gorai River Restoration Project, Phase II
3	Tendering method	OTM, ICT with pre-qualification
4	Name of works as per Tender	Dredging of Gorai River (1st year Capital Dredging and 2nd year Maintenance Dredging.)
5	Name of the Daily News Paper where proposal for pre qualification was invited	The Daily Inquilab dated 10-12-2009, The Daily Financial Express dated 10-12-2009.
6	Selling of pre qualified documents	Up to 9-2-2010
7	Receiving of Pre qualified documents	10-2-2010 up to 12 noon
8	Meeting of TEC	05-05-2010 & 23-05-2010
9	Total number of pre-qualified contractors	10 nos.
	B. Invitation for financial offer	
10	Date of starting of Selling of Tender Documents	25-05-2010 (to the pre qualified contractors).
11	Last date and time of selling of Tender Documents	29-06-2010.
12	Last date and time of receiving of Tender Documents	30-06-2010 up to 12:00 noon.
13	Total No. of Tenders received	4 nos.
14	Date and time of opening of Tender. If any member of the Tender Opening Committee (TOC) was present while opening tender documents?	30-06-2010 at 12:30 p.m.. All the members of TOC were present.
15	No. of responsive tenders	4 nos.
16	No. of non-responsive tenders and reasons	-Nil-
17	No. of External Members in the Tender Evaluation Committee (TEC)	2 persons.
18	Date of meeting of TEC	07-07-2010.
19	Date of approval of Minutes of meeting of the TEC	07-07-2010.
20	Date of preparation of Report of the TEC	07-07-2010.
21	Date of approval of the report of the TEC	29-08-2010 by CCGP.
22	Date of Notification of Award	29-08-2010
23	Total Contract Price	Tk. 205.53 crore.
24	Date of Signing of Contract	20-09-2010.
25	Date of Award of Contract	20-10-2010.
26	Date of commencement of work	20-10-2010.
27	No. of days of time extension, if any	Did not arise.
28	Date of completion of work	May. 2011.
29	Date of submission of final bill and its value	Tk. 203.05 crore.

30	Date of Payment of Final Bill and its amount	Tk. 203.05 crore.
31	TEC was as follows:- 1. Director General, Bangladesh Water Development Board. 2. Additional Director General (O & M-2), BWDB, Dhaka. 3. Mr. Nur Jamat Biswas, Deputy Chief Engineer, BIWTA, Motijheel, Dhaka. 4. Director, Contract & Procurement Cell, BWDB, Dhaka. 5. Director, Directorate of Finance, BWDB, Dhaka. 6. Mr. Rowshon Habib, Superintending Engineer, PWD PECU Circle, Dhaka. 7. Project Director, Gorai River Restoration Project, Phase-II, BWDB, Dhaka.	 Convener Member Member Member Member Member Member Secretary
32	Approving Authority	CCGP

Comments:
The tender has been approved properly as per Clause No. 61 of PPR-2008.

4.3.5 Case Study-V

Procurement of 2 (Two) sets of. dredgers.

	Procurement of 2 nos. Dredgers	
1	Implementing Agency	Bangladesh Water Development Board (BWDB)
2	Name of the Project	Gorai River Restoration Project, Phase-II
3	Tendering method	OTM, ICT.
4	Name of works as per Tender	Manufacturing and Supply of 650 mm Discharge Meter Cutter Suction Dredger with Ancillary Equipments.
5	Name of the Daily News Paper where Tender was invited	Daily Shomokal, Janokantho, Financial Express, Independent Dated 27-05-2010.
6	Date of starting of Selling of Tender Documents	24-05-2010.
7	Last date and time of selling of Tender Documents	17-08-2010.
8	Last date and time of receiving of Tender Documents	18-08-2010 up to 12:00 noon.
9	Total No. of Tenders received	3 nos.
10	Date and time of opening of Tender. If any member of the Tender Opening Committee (TOC) was present while opening tender documents?	18-08-2010 at 12:30 p.m. All the members (3 members) of TOC were present.
11	No. of responsive tenders	2 nos.
12	No. of non-responsive tenders and reasons	1 no. Did not fulfill the qualification criteria as per tender document.
13	No. of External Members in the Tender Evaluation Committee (TEC)	2 persons.
14	Date of meeting of TEC	2 meetings were held on 30.09.2010 and 5.10.2010.
15	Date of approval of Minutes of meeting of the TEC	05-10-2010.
16	Date of preparation of Report of the TEC	05-10-2010.
17	Date of approval of the report of the TEC by CCGP	11-11-2010 by CCGP.
18	Date of Notification of Award	14-11-2010.
19	Total Contract Price	Tk. 239.57 crore.
20	Date of Signing of Contract	06-12-2010.
21	Date of commencement of work	02-01-2011.
22	No. of days of time extension, if any	Not yet approved.
23	Date of completion of work	18 months from the commencement of the works.
24	Date of submission of final bill and its value	Not yet
25	Date of Payment of Final Bill and its amount	Not yet
26	TEC was as follows:- 1. Director General, BWDB, Dhaka.	 Convener

	2. Additional Director General (O & M-2), BWDB, Dhaka. 3. Additional Chief Engineer (RHD), Mechanical Wing, Sharak Bhaban, Ramna, Dhaka. 4. Additional Chief Engineer, Dredgers, BWDB, Narayanganj. 5. Mr. Md. Nur Jamat Biswas, Deputy Chief Engineer, BIWTA, Dhaka. 6. Director, Contract & Procurement Cell, BWDB, Dhaka. 7. Project Director, Gorai River Restoration Project, (Phase II), BWDB, Dhaka.	Member. Member. Member. Member. Member. Member-Secretary.
27	Approving Authority	CCGP

Comments:
The tender has been approved properly as per Clause No. 61 of PPR-2008.

4.3.6 Procurement Specialist

The engagement of Procurement Specialist under any Project demands sufficient justification when the PPR 2008 has already come into force. The ToR of the Specialist as set by BWDB has been studied (Enclosure-3)

From the ToR, it is stated that for procurement in the first stage of the Project includes the following:-

The first stage for procurement of the following contract packages:-

Sl. No.	Description of procurement Packages	Unit	Quantity	Procurement Method & type	DPP cost (Tk in lacs)
1	Procurement of dredgers with accessories	Set	2	OTM	23400.00
2	Initial priority dredging of silt from the off-take of Gorai River by Private own dredger in 1st year	cum	5.00 lacs	OTM (Local)	707.50
3	Capital dredging/Mechanical excavation of Gorai river in 1st year with maintenance dredging in 2nd year	cum	150.00 lacs	OTM (International)	24189.00
4	Procurement of vehicles & other machinaries and equipments	No.	3	OTM	132.00

Scope of the Services for Procurement Specialist in the 1st stage of the Project:

- Preparation of Tender Documents for selection of International Dredging components for Capital Dredging works.
- Preparation of Technical Specification and Tender Document for Capital and Maintenance Dredging.
- Preparation of Technical Specification and Tender Document for Capital Dredging by Local outsourcing.
- Preparation of technical specification and tender document for Procurement of Dredgers and ancillary vessels with spare parts and accessories.
- Procurement of technical specification and tender documents for procurement of equipments, vehicles etc for the Project.
- Interpretation for tender terms and conditions.
- To assist Project Director for evaluation of tenders.
- Preparation of Report for Procurement and any other matter relating to the Procurement.

Observations:-

- Procurement of Services, Goods and Works is one of the main tasks of the Head of the Office, Project Director in this case. He has sufficient efficient and expert officials in the regular set-up of the office of the Project Director. So it would not be justified to engage a Procurement Specialist for the purpose of procurement.
- Preparation of specification and Tender Document is a routine work. So his engagement is not justified on the ground.
- It is seen that Educational Qualification of the Procurement Specialist is Bachelor Degree in Engineering (Mechanical/Civil). This condition has further weakened the justification that one experienced Mechanical Engineer is required for preparing the specifications.
- If any Mechanical Engineer was particularly required, Chief Engineer, Dredgers may be instructed by the Board to extend his co-operation for preparation of the specifications of Dredgers.
- In PPR 2008, PD is working as the Member-Secretary, TEC in which Director General, BWDB is heading the Committee and two external members from other Departments are working as the members of the TEC. Hence, assisting the PD by the Procurement Specialist in the process of tender is not justified.
- Preparation of Report for Procurement is a routine work of the PD and he has regular set-up to assist them.
- The second stage of Procurement was not taken up.

4.4 Implementation status of some important component of works

4.4.1 Manufacturing & Supply of 2 sets of dredgers by BWDB:-

The contract was signed on 06-12-2010 and time allowed for completion of work was 18 months from the commencement of the work. The supplier assembled all parts and machineries at Chittagong and took the dredgers to Kushtia afterwards. But they have not yet been taken over by BWDB. Regarding checking of specification & taking over the dredgers by the department, the following information was obtained;

4.4.1.1 Formation of Committees before acceptance:-

Dredger and Ancillary crafts inspection and acceptance committee was formed vide BWDB's memo no. 256 dated 26.12.2012in accordance with the decision of the meeting held in the MoWR on 26.12.2012. The committee is as follows; (Enclosure-4)

1. Mr. Md. Azizul Haque, Additional Director General (Western Region), BWDB, Dhaka. -Convener
2. A nominated person (not below the rank of Associate Professor of Department of Mechanical Engineering, BUET). -Member
3. A nominated person (not below the rank of Associate Professor of Department of Naval Architecture & Marine Engineering, BUET). -Member
4. Mr. Kazi Tofael Hossain, Executive Engineer, Design Circle-2, BWDB, Dhaka. -Member
5. Mr. Khondokar Monirul Islam, Executive Engineer, Design Circle-3, BWDB, Dhaka. -Member
6. Mr. Md. Shahjahan, Superintending Engineer, O & M Circle, Dredger Directorate, BWDB, Narayanganj. -Member-Secretary

Another committee- has been formed vide BWDB's memo no. 595 dated 9.9.2013-in accordance with memo no. 42.034.014.00.00.032.2013-639 dated 1.9.2013 of MoWR on the observation of the acceptance committee formed on 12.12.2012 & for amicable settlement with the supplier. The committee is as follows; (Enclosure-5)

1. Additional Director General (Planning), BWDB, Dhaka. -Convener
2. Chief Engineer, Mechanical Equipments Directorate, BWDB, Dhaka. -Member
3. Chief Engineer, Dredger Directorate, BWDB, Narayanganj. -Member
4. A nominated person of relevant subject from BUET (not below the rank of Associate Professor). -Member
5. Director, Contract & Procurement Cell, BWDB, Dhaka. -Member
6. Mr. Ekramul Kabir, Additional Director, Directorate of Finance, BWDB, Dhaka. -Member
7. Mr. Abdul Wahab, Executive Engineer, Bheramara Dredger Division, BWDB, -Member-

Bheramara. Secretary

Another Committee has been formed vide MoWR's memo no. 1016 dated 2.4.2014 to check the performance as per specification of the Dredge Pump. The Committee is as follows:- (Enclosure-6)

1. Mr. Muzaffar Ahmed, Chief Engineer (now on PRL) -Convener
2. Mr. Sohrab Uddin, Superintending Engineer, Dredger Directorte -Member
3. Mr. Nazir Ahmed, PD, GRRP, Phase-II -Member
4. Mr. Kazi Tofael Hossain, Executive Engineer, Design Circle-2, BWDB, Dhaka. -Member

In this connection, it is also observed that one pre-shipment inspection of Dredge pump at USA was made from 23-01-2012 to 03-02-2012. Project Director and APS to the Minister were the members of the team. Another pre-shipment inspection of Engine of Hydraulic component at Netherlands, Belgium and Germany was made from 26-10-2011 to 06-11-2011. Additional Director General (O & M-2), 2 no. Executive Engineers and PS to the Minister were the members of the team.

The dredgers have not yet been taken over by the Department.

4.4.1.2 Deployment of 2 sets of dredgers in the Project work:-

But it is seen that the dredgers are being used in the Project work i.e. in the dredging of Gorai for this year program. Those were used for the last year program also. Before officially taking up, it is not clear how those are being used for the Project.

4.4.1.3 Operation & maintenance of the 2 sets of dredgers:-

Mr. Abdul Wahab, Executive Engineer (Mechanical) was asked whether he was under the project set-up or coming from the Dredger Directorate. He replied that he was under Dredger Directorate. He also told that the dredgers are now being operated by the manpower supplied by outsourcing and the manpower from Dredger Directorate. The Executive Engineer also told that the Dredgers are being operated as per his instruction and along the alignment fixed by IWM. He also told that the Department is issuing fuel with lubricants for running the dredgers and the cost is being charged to the Project.

The set-up of the personnel for the Dredgers has been furnished by the Project Director which is as follows:

SL. NO.		Sanctioned post	Sanctioned no. per dredger/vessel	Total no. of technical manpower	Existing no.
1.	**For dredger "BWDB CSD Gorai & Padma**				
	a)	AE/SDE (Mech)	1	2	0
	b)	Master (1st Class)	1	2	0
	c)	Driver (1st Class)	1	2	0
	d)	Leverman	2	4	0
	e)	Asst. Driver	2	4	2
	f)	Oilman	2	4	0
	g)	Sukani	2	4	0
	h)	Lasker	8	16	4
	i)	Bhandari/Cook	1	2	0
	Sub-total 1		**20**	**40**	**6**
2.	**For "BWDB Work Boat- 12 & 13"**				
	a)	Master (1st Class)	1	2	0
	b)	Driver (1st Class)	1	2	0
	c)	Oilman	1	2	0
	d)	Lasker	1	2	0
	Sub-total 2		**4**	**8**	**0**

3	**For "BWDB Tug-15"**				
	a)	Master (1st Class)	1	1	0
	b)	Driver (1st Class)	1	1	0
	c)	Oilman	1	1	
	d)	Sukani	1	1	0
	e)	Lasker	2	2	0
	f)	Bhandari/Cook	1	1	0
	Sub-total 3		**7**	**7**	0
Total (1+2+3)				**55**	**6**

4.4.1.4 Training for manpower:-

There is provision for imparting training to the manpower of the Dredgers by the supplier. The Project Authority has not yet given the name to the supplier. As a result, the training part is remaining incomplete, it may cause hindrance at the time of taking over the Dredgers. In this connection it is mentioned here that the Administrative approval of MoWR regarding extension of project period up to June 2014 has clearly stated that the training of the BWDB operators by the supplier of 2 no. dredger must be completed within project period **(Enclosure-7)**.

4.5 Bathymetric survey by IWM

IWM is doing the Bathymetry survey and working out the volume of dredging work on the basis of pre and post work measurement. It is observed that one dredging specialist has been engaged in the team whose ToR is to assist the Project Director for Planning of Dredging operation and for dredged spoil management. His another task is seen to provide suggestions in taking decisions on fixation of dredging alignment. When the alignment would be fixed on the basis of Mathematical Modelling Study, it is not clear for the input the dredging specialist would provide in this connection. Moreover, the dredged spoil management has been observed to be very poor. The contract of IWM with BWDB has expired on June, 2013 and it has not yet been extended. IWM is working for this year's program subject to renewal/extension of the Contract. It is learnt that the contract could not yet been extended as there is further provision for this in the DPP.

4.6 Mathematical Modeling by IWM

The alignment of dredging works is fixed on the basis of Mathematical Model and its results. Their original contract has been extended up to June, 2014.

4.7 Flow Divider and Ganges-Gorai Guide Bundh

These two components of work have not yet been started. When asked to explain the reason behind this, it was clarified that the embankment construction and protection work have been proposed to be included in the Feasibility Study being financed by the World Bank through ECRRP. This is why they have not even been included in this year's program and no provision has been kept for them. There are many more discussions and decisions on it. Such decisions regarding the construction of Ganges-Gorai Guide Bundh, Flow Divider and the revision of the DPP are as follows:-

Keeping in consideration the possibility of achieving financial assistance from the World Bank, in the actual DPP, provision of construction of Flow-divider and Ganges-Gorai Guide Bundh were included. For these two works, Tk. 15000 lacs and Tk. 12000 lacs were shown as Indicative Cost.

Decision taken in the first meeting of the Steering Committee held on 30-04-2012 is as follows:-

After receiving the Feasibility Study Report aided by the World Bank on June, 2012, discussions on whether the World bank would provide financial assistance to construct structures (Flow Divider and Ganges-Gorai Guide Bundh) would be held. Otherwise, BWDB would assess scopes to construct the same using local funding.

Decisions made in the 2nd Steering Committee meeting held on 05-12-2012 are as follows:-

The Director General, BWDB would take necessary steps to place the proposed DPP with a view to sending it to the ECNEC meeting to be held on March, 2013 after discussing with the World Bank. As the World Bank had consented to finance the construction of the Flow-divider and Ganges-Gorai Guide Bundh as suggested in the Updated Feasibility Study, the corrected DPP would not include the expenditure of the two structures. The two DPPs, one excluding the construction cost of Ganges-Gorai Guide Bundh and the Flow-divider and including implementation of Gorai River Restoration Project Phase-II using GoB fund and the other one for construction of Ganges-Gorai Guide Bundh and the Flow-divider to be financed by the World Bank are to be prepared and placed unanimously for approval from the ECNEC. As maintenance dredging would be needed to conduct during the construction period of Ganges-Gorai Guide Bundh and the Flow-divider, implementation period would be extended for another two (02) years. BWDB would take necessary steps regarding the matter.

It was decided in the 3rd Steering Committee meeting that the DPP for construction of Flow-divider and Ganges-Gorai Guide Bundh and the DPP for Gorai River Restoration Project Phase-II would be submitted to the Ministry of Water Resources without delay.

The decision made in the meeting held on 30-04-2013 on the corrected DPP of Tk. 66435.39 lacs that submitted at the Ministry of Water Resources is as follows:- Necessary steps would be taken from the side of BWDB to submit 1st corrected DPP of Gorai River Restoration Project Phase-II and DPP for construction of the off-take structures at a time in the ECNEC. In the chairmanship of one Additional Director General (Planning), BWDB, Dhaka, a committee to assess the justification of constructing structures would be formed and the committee would justify the viability to re-shape the project through field visit. In response to that, the committee suggested to keep aside the off-take structures curtailing the DPP amount to Tk. 62100.70 lacs and the report was placed on the date 08-10-2013

4.8 Plan form study adjacent to Gorai off-take

The component of work has not yet been taken up as they are related to the implementation of Guide bundh and Flow Divider.

4.9 Achievement of objectives

ToR no. 3 To assess Project's impact in terms of reduced salinity, more surface and ground water for domestic use, irrigation of lands, crop, fish and forest productivity, navigability and cheaper cost of river transport, reduction in cost and loss of crops, loss of water, ecological balance, lesser environmental pollution, increased rural employment and reduced poverty of rural people:-

These aspects have been described under the coverage of the ToR. For conducting the Mid-term Evaluation, questionnaire was prepared for the beneficiaries such as farmers, boatmen, fishermen and sand traders etc.

Sl. No.	Name of objectives	Status of achievement
1	Salinity	The salinity of Gorai has been observed to be zero at Kushtia. IWM is taking salinity measurement at 40 stations of which 13 stations are related to Gorai River System. Out of 13 stations, salinity measured by IWM for 3 stations i.e. Khulna, Mongla and Hiron Point have been taken for the Study as they are most representative. The result shows that salinity increased in 2011, decreased in 2012 and again increased in 2013. Though the total data has not yet received for the current year, the salinity has been observed

		to have been increased. The main objective of the Project was to lower down the salinity level to 1 ppt at Khulna and 20 ppt around the Sundarbans Reserved Forest. But the result shows that the target has not yet been achieved.
2	Surface and ground water level	The level of surface water and ground water has been observed to be increased.
3	Irrigation	The Irrigation Position has improved. On the left bank of Gorai, Irrigation is done by water mostly from shallow tube-wells. On the right bank, irrigation water is available from the G-K Project.
4	Crop productivity	Crop production has increased with the improvement of Irrigation facilities.
5	Fish productivity	The fish production is not satisfactory as the river Gorai remains dry for 6 months in a year when the water starts flowing from Ganges to Gorai in the wet season, the fish production increases.
6	Forest productivity	The salinity of water around the Sundarbans Reserved Forest could not be lowered down to 20 ppt. Hence the Sundari trees may face problems in its normal growth.
7	Navigation	There is no navigation in Gorai during six months in lean period when the river Gorai is dry and no flow of water through it. Navigation starts in wet season when the water starts flowing through Gorai from Ganges.
8	Cost of river transport	The cost of river transport is always less.
9	Rural employment	Rural employment was observed to have been increased. Though the fishermen and boatmen suffer in the lean period when there is no water in Gorai, they work in agriculture and sand trading business and go back to their original profession in the wet season. Their number is very small in comparison to the number of other professions. The farmers and the sand trading related people are getting more scope of work and employment opportunity.
10	Environment	Impact on environment can be assessed after six years from the starting of the Project. This Project was started in November, 2009. Hence environmental impact evaluation may be done in 2016.

From their reply and discussion, it is seen that almost the entire area has been brought under irrigation by shallow tube-well. As the surface and ground water table has improved, it is helping the irrigation by tube-wells.

There is almost no water in the river during the lean period. As a result there is no navigation during this time. The Boatmen and Fishermen suffer most for want of water and they switch over to work as day laborer in the Agricultural and Sand Trading sectors. When water comes, they return to their original profession. As a result the financial condition is not hampering.

4.9.1 Salinity

As regards to salinity, it is seen that there is no salinity in Kushtia, Kumarkhali and Khoksha. IWM has done the regular monitoring of the salinity of Khulna and waterways around Sundarbans Reserved Forest. The monitoring stations are Khulna, Mongla and Hiron Point. The salinity position of these three stations has been given in Table No. 1 & Figure No. 1 for Khulna, Table No. 2 & Figure No. 2 for Mongla and Table No. 3 & Figure No. 3 for Hiron Point. The main objective of the Project was to lower down the salinity level to 1 ppt at Khulna and 20 ppt around the Sundarbans Reserved Forest. But the result shows that the target has not yet been achieved. In this connection, it is mentioned here that IWM monitor salinity at 40 stations out of which 13 stations are related with Gorai River System. Of them, 3 stations at Khulna has been chosen for salinity at Khulna, Mongla for the Sundarbans Reserved Forest and Hiron Point for the outfall at bay of Bengal.

Table 1: Monthly maximum salinity observed at Khulna

Month	Salinity observed in different year (ppt)			
	2011	2012	2013	2014
Jan	1.7	0.3	0.6	1.6
Feb	10.4	0.5	1.9	5.2
Mar	12.2	4.2	4.8	8.1
Apr	16.3	7.3	9.3	10.9
May	16.8	4.4	8.9	
June	4.1	3.1	2.1	

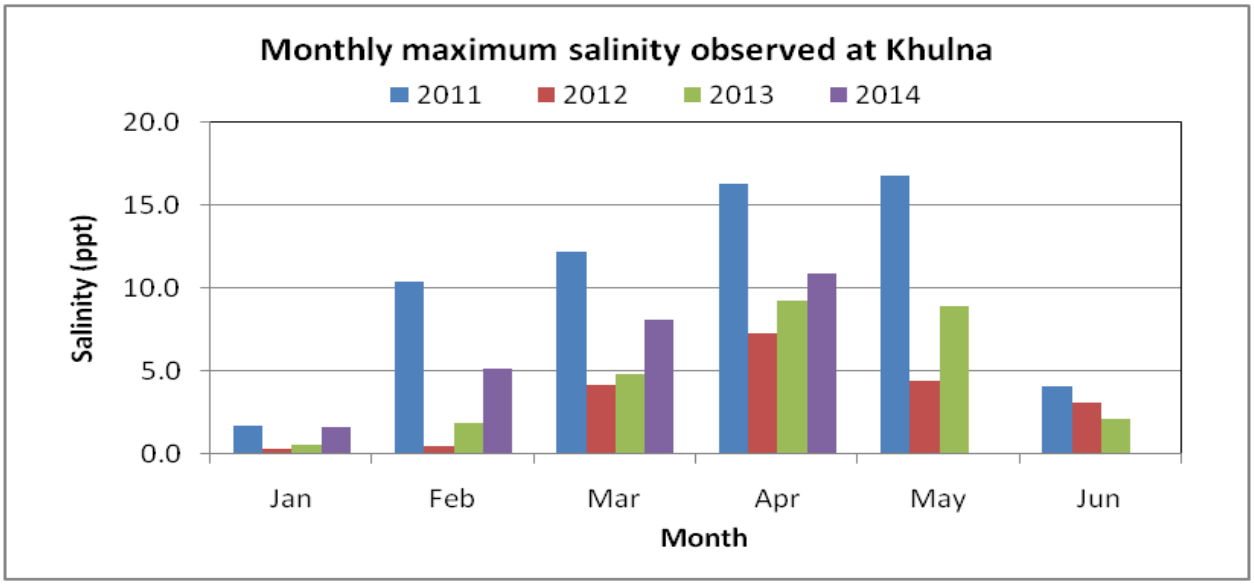


Figure No. 1: Salinity observed in Khulna during dry season at different months.

Salinity level was around 17 ppt in 2011 as it has been reduced to 8 ppt in 2012. The salinity during 2012 dropped after mid April. It continued to increase upto the end of April, 2013 and receded in May, 2013. The maximum salinity observed was around 9 ppt.

Table 2: Monthly maximum salinity observed at Mongla

Month	Salinity observed in different year (ppt)			
	2011	2012	2013	2014
Jan	6.30	1.90	3.30	4.2
Feb	10.20	4.80	6.40	8.1
Mar	14.40	9.90	10.20	11.90
Apr	19.40	13.10	14.40	15.10
May	20.70	12.9	14.90	
Jun	19.00	10.60	12.80	

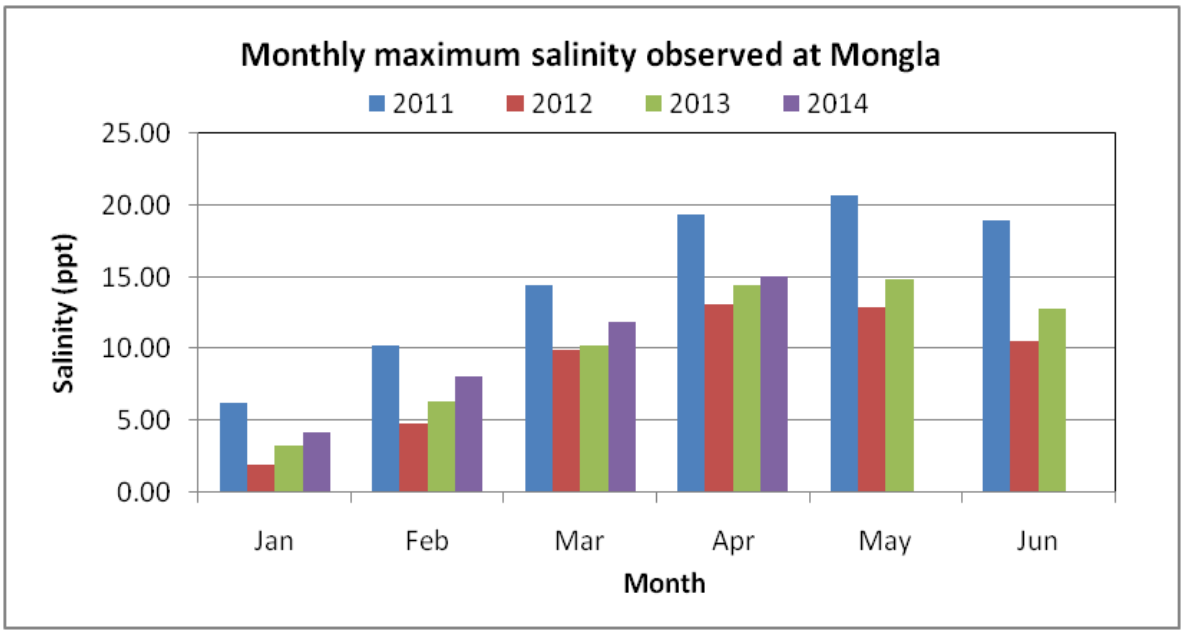


Figure No. 2: Salinity observed at Mongla during different years.

The salinity level at Mongla was around 20 ppt in 2011 and it has come down to 12 ppt in 2012. It again rose upto 15 ppt during 2013. This happened due to decrease in fresh water flow during 2013 in comparison with that of 2012.

Table 3: Monthly maximum salinity observed at Hiron point

Month	Salinity observed in different year (ppt)			
	2011	2012	2013	2014
Jan	20.6	24.4		18.70
Feb	22.9	24.2	24.2	22.7
Mar	25.7	24.0	25.1	
Apr	27.3	25.0	28.2	
May	22.9	24.1	28.3	
Jun	21.4	15.6	14.9	

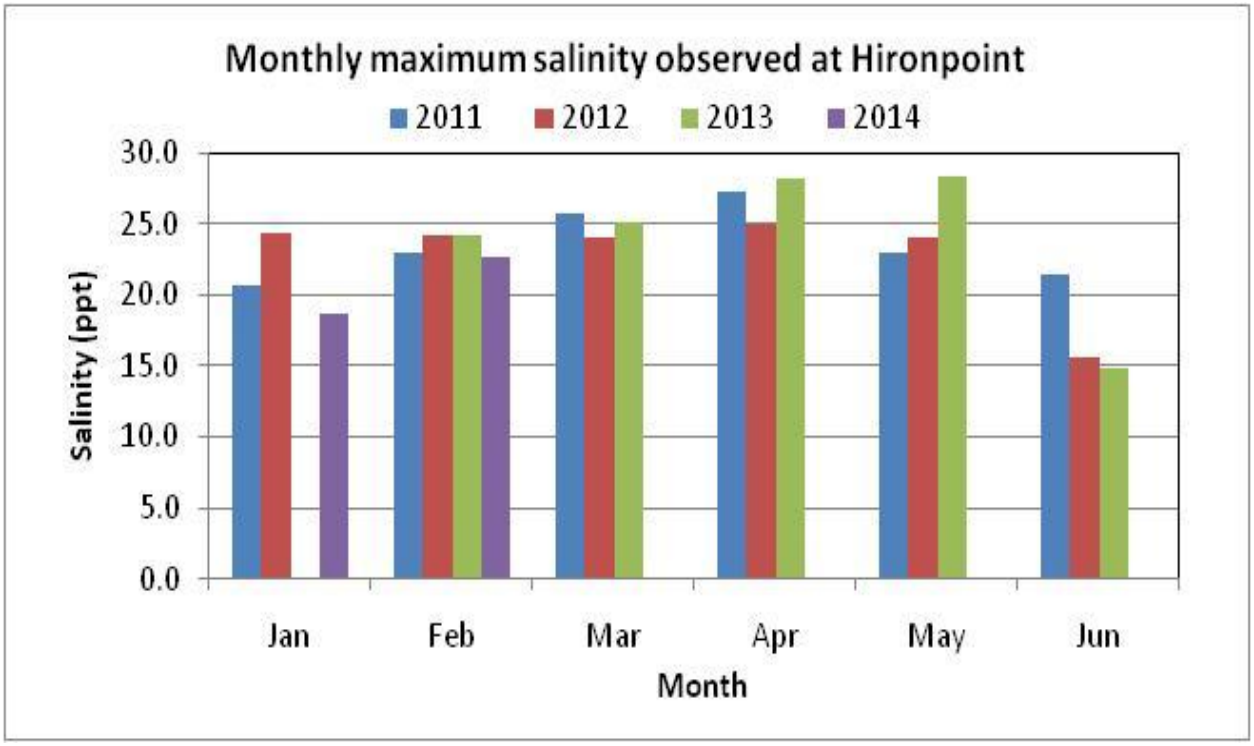


Figure No. 3: Salinity observed at Hiron Point at different years.

The salinity level at Hiron Point was around 27 ppt in 2011 and it was aound 25 ppt in 2012 and 2013. The salinity during dry season of 2012 fluctuated due to presence of fresh water flow but it increased continuously up to April during 2013.

4.9.2 Sedimentation

It is observed that IWM is monitoring the sedimentation concentration of Gorai and Ganges at different points of the rivers .The sediment concentration ranges vary from 2000 mg/l to 20 mg/l during june to September.The sediment concentration during the month of late August and September were very high in comparison with those of other month of 2013.

4.9.3 Flow diversion:

Adequate flow from Ganges to Gorai in October to May is very much necessary for the restoration of booth agriculture and environment of the area. Initial priority dredging was carried out in late 2009 to June 2010 where the continuity of flow was established in May 2011(05.05.2011) through removal of humps up to Gorai railway bridge. The dredging resume in November 2011 and continued up to May 2012. Due to early start and rapid progress, the higher flow diversion ratio from the Ganges to Gorai continued during the dry season. It is observed that diversion flow ratio during October 2011 to April 2012 varied between 8%-10%. This flow ratio is inspiring from dredging point of view. The discharge in the Gorai during monsoon 2012 was also found higher than that of previous year. The flow diversion ratio was relatively less (around 5-13%) up to May during dry season 2013.The dredging of Gorai was started in January/2014.It was abnormal in comparison to previous years. Naturally the flow ratio will be less during 2013-14.

4.9.4 Environmental Management Plan:

The environmental management plan of Gorai river restoration project (phase 2)needs to be prepared for suggesting mitigation measures to minimize the effect of the negative impact to an acceptable level, enhancement measures for increasing the benefits of the positive impacts.

Proper maintenance of the dredgers shall be done. Regular dredging program shall be taken up to ensure the fresh water flow during dry period.

Salinity improvement procedure shall be taken up for reduction of salinity level to the desired level suitable for Khulna and Sundarban.

To monitor the environmental impact after implementation of the project, indicator such as discharge water level and surface water salinity of Gorai and its river system need to be monitored.

Program for erosion monitoring of Gorai should also be monitored and action taken as required.

Salinity at a few location of Gorai-Rupsa-passur river system, Mongla river should be monitored for dry season.

Increased flow from the Gorai river is expected to impact the resources and ecology of the Sundarban.
The Sundarban mangrove ecosystem which is currently degrading due to increased salinity and sedimentation would rejuvenate due to increase in the supply of fresh water. This would revert the current trend of replacement of the low salinity Sundori trees by high salinity tolerant species and species composition would get back to the pre Farakka period.

Sundarban:

Flora:

The mangrove all over the world have been classified into different bio geographic formations. The Sundarbans mangrove belongs to Indo-Malayan bio geographic region. Due to its floral richness and dominant floral element mangrove along the north eastern coast of the Bay of Bengal occupy a unique position among the global mangroves. The natural vegetation of the forest is composed of true mangrove trees and mangrove associates. The diversity of mangrove plants of the Sundarban includes about 130 plant species, belonging to 22 families representing 30 genera. The forest canopy north central part shows 4-5 strata, typical of the tropical rain forest formation. Epiphytes and woody parasitic species are common at the tree crown. In the northeast where fresh water flow is maximum, the Sundori either in pure patches or interspersed with Gewa, Passur, and Kankra dominate the area. The Sundori and Gewa grow permanently throughout the area with discontinuous distribution of Dhundal and Kankra. The south with evidently the greatest seasonal variation in salinity levels, possibly represent an area of relatively longer durations of moderate salinity where the Gewa is dominant woody species. It is often mixed with Sundori in Backswamps, which receives frequent flooding by the tidal water. It is also frequently associated with a dense under storey of the Goran and sometime Passur. In the new accretions and along the confluence of wide river courses, the Keora forms pure patches.

Fauna:

The area is known for its wide range of flora and fauna including Royal Bengal Tiger. Over 270 species. of birds, 35 species. Of reptiles, and 42 species. Of mammals, and 400 species. Of fishes are recorded. At present there are some 42 species of mammals within and in the neighborhood of the Sundarbans. The larger terrestrial mammals found in the Sundarban are: tiger (Panthera tigris), spotted deer, wild bear, barking deer and Rhesus macaque. Fishing cats and jungle cats have been also reported from Sundarbans.

The following parameter have been selected for the Environmental Management Plan and ultimate preparation of Environment Impact Assessment Report.

1. Discharge
2. Water level
3. X-section of some river.
4. Surface water.
5. Drinking water.
6. Bank erosion.
7. Sedimentation.
8. Flora & fauna of Sundarban.

4.9.5 Socio Economic Condition

The implementation of the physical component of the project is confined within Kushtia district but its effects are bringing benefits to Khulna and Sundarban by increasing fresh water supply through river system. So socio-economic condition needs to be assessed .Agriculture, fisheries, sanitation, drinking water, health facilities, salinity of surface water and ground water etc. data are required for the study. These information's have been collected from the beneficiaries through questionnaires. They have been analyzed and processed which have been presented in chapter 3 of this report.

4.10 Other issues

4.10.1 Cost effectiveness of purchasing of dredgers

To find out the cost effectiveness of dredging rate, the office of the Project Director, the office of the Superintending Engineer, Design Circle-2 has been contacted. The office of the PD furnished the following information regarding comparison of cost of dredge spoil by Local & International outsourcing with that of 1 cum of dredging soil by departmental dredgers.

- In 2010-11, the dredging works was done by International outsourcing Dredgers (Capital Dredging). The rate quoted by them was 1 cum cost $ 02 dollars i.e. Tk. 138.92 ;[$ 1= Tk. 69.46 at that time].
- In 2011-12, dredging by International outsourcing dredgers. The quoted rate was 1 cum $ 1.90 dollars i.e. Tk. 131.97 ;[$ 1= Tk. 69.46 at that time]
- In 2012-13, the dredging work was done by newly procured 2 nos. dredgers. The rate was the cost of 1 cum dredging soil is Tk. 111.87.
- For current year program, the cost has not yet found out.

The Design Office could not give any analysis for the cost of 1 cum dredged soil by 26 inch dredger. Later, Mr. Mozaffar Ahmed, Chief Engineer (Retd.), Dredgers has been contacted over telephone to know information regarding this. In this connection, it is mentioned here that Mr. Mozaffar Ahmed has been made convener of a four member committee formed by the MoWR to find out the dredge pump capacity of the newly procured two nos. dredgers under the Project. One of the ToR of the committee is to find out the cost effectiveness of the dredgers and it is known that the committee has not yet submitted the Report and the information regarding cost effectiveness of the Dredgers. The schedule of Dredger Directorate for 1 cum cost of dredging soil for 18 inch dredger is seen that it is Tk. 133. Hence, the case is complicated and it needs detail analysis on the basis of which the cost will be calculated. Moreover, the rate which is found out should be consistent with that of other Departments such as BIWTC, Chittagong & Mongla Port Authority etc. So we should wait for the cost found out by the committee headed by Mr. Mozaffar Ahmed in which the members who are included are all quite experienced in this sort of analysis and finding out rate.

4.10.2 Erosion due to dredging

In the FGD meeting, there was strong objection to the dredging work as in their opinion the land has been eroded due to dredging. Particularly the objection was most serious at Khoksha Upazilla FGD.

In the FGD of Kumarkhali and Kushtia, it was observed that they were telling that erosion was being happened due to dredging though at the same time, they were telling that due to the dredging work, the area is being benefited.

The Project Authority has informed that the IWM has already studied in details throughout the length of Gorai. So the Project Authority will investigate into the allegation of erosion due to dredging on the basis of this report by IWM and come out with specific recommendation to face the problem at the field level.

4.11 Revision of DPP

It is learnt that the DPP have been revised and now is lying at the Planning Commission. It has been sent to the Planning Commission by MoWR **(Enclosure-8)**. The main characteristics of the Revised DPP is as follows:-

	Original	**Revised**
a) Cost	Tk. 94214.55 lacs	71267.00 lac
b) Completion Time	June, 2013	June, 2017
c) Components with costs (dropped from original)	Guide Bundh (12000.00) Flow Divider (15000.00) Plan form Study (150.00)	
d) Component (incorporated in the Revised)	Temporary Protection Work Permanent Protection Work	

4.12 Feasibility Study of Ganges Barrage Study Project

The feasibility study and detailed design of the project has recently been completed by4 no international consulting firms from China, Australia and Pakistan and 4 no. local consulting firms under the leadership of Development Design Consultant (DDC) a renowned consulting firm of Bangladesh. In addition to this, 4 no. expert organization such as IWM, RRI, CEGIS and DATEX have played important roles by providing important information and data for the feasibility study and detailed design.

4.12.1 Background

The Ganges Dependent Area (GDA) in the south western of Bangladesh constitutes about 37 percent of the area of the country. About one of the population lives in the area.

In 1975, India commissioned a barrage across the Ganges at Farakka to divert 40000 cusec water into Baghirathi-Hoogly river in West Bengal for the purpose of flushing the silt to improve navigability of Kolkata port.

Over more than three decades, the water resources of the Ganges have been in a regular process of degradation, economic activities in agriculture, fisheries, industries etc. were shrinking and development potentials were stopped or mitigated at an alarming rate.

The above needs locally justify the feasibility study of Ganges Barrage Project. The shows that the planning for implementation of Barrage is economically viable, society acceptable, technically implementable and environmentally sustainable.

4.12.2 Project Summary

a. Location:	Pangsha under Rajbari district
b. Project cost:	BDT 31414 crore
d. Component of works;	

1. Ganges Barrage(Main barrage and allied structure)

1) length of the barrage:	2.1 km
2) Spillway:	78 gates each 18 m wide
3) Under sluices:	18 gates each 18 m wide.
4) Navigation Lock:	14 m wide
5) Fish pass:	2 nos. each 20 m wide
6) Hydro power plant (4 Turbines): capacity	76.4 MW
7) Left guide bundh:	5.4 km
8) Right guide bundh:	6 km
9) Railway bridge:	2.1 km

2. Gorai Offtake

1) Length:	390 m
2) Spillway:	15 gates each 18m wide
3) Navigation lock:	14 m wide
4) Fish pass:	20 m wide
5) Hydro power plant (3 Turbine):	capacity 36.6 MW
6) Left guide Bundh:	2.7 km
7) Right guide Bundh:	5.3 km

3.Hisna Offtake Structure

1)Length	51 m
2)Spillway:	5 gates each 6 m wide
3)Fish pass:	6 m wide

4.Chandana Off take Structure

1)Length	30 m
2)Spillway	4 gates each 6 m wide

5.River Training Works

- T Groyne-1 5.3 km
- T Groyne-2 4.8 km
- River Bank Protection Works 14.5 km

6. Afflux Bundh/Flood Embankments 261 km

7. Link Roads 15.5 km

8. Regulator 8 nos.

9. Bridges 10 nos.

10. Improvement of river system 1116 km

4.12.3 Objective Of The Project

- To increase agricultural production, especially production of sweat water fish as well as livestock.
- To reduce salinity remove arsenic
- To increase employment opportunities and income generation in the project area through optimum use proper management of the Ganges water expected to be available under the Ganges Water Treaty of 1996.
- To improve island navigation.
- To ensure protection of the bio-diversity of the Sundarbans
- To provide additional water for industrial development of the Khulna region
- To create better drainage conditions in poldered areas.

4.12.4 Impact of the project on Gorai River Restoration Project

The main function of the Ganges Barrage would be to store water for dry season through flow control.

The Ganges Barrage will create scope for meeting the long-term demand of utilizing Ganges water for different sectors leading to sustainable development of the Ganges Dependent Area.

Diversion of Ganges water from the upstream of the barrage through the Gorai-Madhumati-Nabaganga system along with two other systems such asHisna-Mathabhanga-kopadac system and Chandana-Barasia system will rejuvenate the rivers with flow of fresh water in dry season which would push down the salinity. In addition, the increased upland discharge would result in lowering the rate of sedimentation in the rivers.

Hence, if the project is implemented, there will be no need for taking up such projects/scemes on Gorai separately and even for preparation of schemes on the distributaries of Ganges.

4.13 Technical & Steering Committee Meeting

- The meeting of the Technical Committee on the Draft Report was held on 19-05-2014. Minutes of the meeting is enclosed **(Enclosure-9)**. The recommendations of the meeting and their compliance are given as follows:

Sl. No.	Recommendations of the Meeting	Compliance
01	Main observations should be in the Executive Summary. Methodology should be written in one para.	Complied in Executive Summary.
02	Salinity around the Sundarbans is more than 20 ppt and around Khulna is more than 1 ppt. So the objective of the Project has not been achieved. Clear comments in this connection should be mentioned.	Complied in para 4.9.1.
03	Clear comments should be made whether the purchase of 2 nos. dredgers is cost-effective in consideration of the working life of the dredgers.	Making comments needs more information and time. Concerned source has already been

		contacted.
04	Recommendations should be made for suitable method in place of Single Source.	Complied in para 4.3.3.
05	Clear Comments should be given whether 2 nos. dredgers have been purchased as per specifications.	3 nos. committees consisting of Experts such as Professors of Naval Architecture and Mechanical Engineering Department have been formed for the purpose. The comments of those Reports should be considered.
06	Spelling of the Report needs to be corrected.	Complied.
07	Table should be numbered.	Complied.
08	Table should contain no blank space and value should be mentioned in spite of given value.	Complied.
09	Foot note should be given if there is no data in the table.	Complied.
10	Setting of pages should be done in order in the Report.	Complied.
11	The value should be written properly in Table No. 2.4 & 2.5.	Complied.
12	Increase or decrease of any result should be written separately.	Complied.
13	The income of the respondents has increased at the same time expenditure has also been increased due to inflation. It should be clearly mentioned in the Report.	Complied.
14	It should be correctly mentioned who has formed the Committees.	Complied in para 4.4.1. & 4.4.1.3.
15	Correct information should be furnished regarding the manpower of the dredger.	Complied.

- The meeting of the Steering Committee was held on 29th May, 2014. The minutes of the meeting is enclosed **(Enclosure-10).** The recommendations of the meeting and their compliance are given as follows:

Sl. No.	Recommendations of the meeting	Compliance
1.	Recommendation is to be made in the Report that dredging in Gorai should be continued as regular work program rather than executed under a Project.	Complied as per Sl. No. 1 of the recommendations in Chapter 6, Page No.
2.	Recommendation is to be made for starting dredging work in proper time and taking over the dredgers officially.	Complied as per Sl. No. 2 of the recommendations in Chapter 6, Page No 76.
3.	The issue of engagement of manpower and their training is to be clearly mentioned in the Report.	Complied as per Para 5.3.1 in Chapter 5, Page No. 75.
4.	Recommendation is to be made in the Report for the solution of the Problem of erosion at Khoksha due to dredging at Kumarkhali.	Complied as per Sl. No. 9 of the recommendations in Chapter 6, Page No. 76.

- The workshop was held on 29-06-2014

Chapter 5

Strength & Weakness of the Project

5. Strength & Weakness of the Project

ToR No. 4:- To identify the strength and weaknesses and possible threats towards effective management of Gorai River Restoration and its sustainability.

5.1 Strength:

The project is being implemented by BWDB which has the capability and experience to implement such type of big projects. This is an on-going project under Annual Development Program and there is no budgetary problem. Moreover two sets of dredgers have already been procured under the project which will be used for yearly routine maintenance dredging of Gorai. This has given the project sufficient strength. Moreover the feasibility study of Ganges Barrage Project has recently been completed under GOB funding and awaiting government clearance for its implementation. This would impact the Gorai river restoration project as Gorai is the main distributor of Ganges and as all its objectives will be covered by Ganges Barrage Project. So this would act as another strength of the project.

5.2 Weakness & Bottleneck

During the study some weakens & bottleneck have been identified which needs immediate attention for the interest of the project. They are as follows:

5.2.1 Manpower

The main weakness as identified is the non employment of the required and trained manpower for the operation and maintenance of the dredgers. Only 6 no. Mechanical personnel are now working against 55 nos. required. It is known that they are coming from Dredger Directorate. There is provision for imparting training by the supplier under the contract. But till to date the project authority could not yet placed the personnel at the disposal of the supplier for the training purpose. When the project officials were contacted in this connection, they replied that the project has no manpower, the dredgers are being run by the personnel from dredger directorate. And the dredger directorate has replied that they cannot send the personnel due to shortage of manpower. This unearthed the grim picture of acute administrative weakness.

5.2.2 Administrative Set-up

The set-up of the project shows that there is shortage of mechanical personnel to run the project. Being asked in this connection, the project authority replied that the dredgers would be run by Dredger Directorate. But when the Dredger Directorate was requested by the Project Authority to place personnel at the disposal of the supplier for getting training under the contract, they failed to do on the ground that they have no manpower for this. This clearly shows that Dredger Directorate cannot run the project. Moreover the project should be run by manpower under the administrative control of the project director. Hiring personnel from dredger directorate would not solve the problem. In that case hiring personnel through outsourcing may become more fruitful.

5.2.3 Budget:

The project has been proposed to be extended up to June, 2017. It is presumed that there will be no budgetary problem during this period. But what would happen when the project would come under revenue budget. Whether the budget for maintenance dredging will be ensured that time? If not the sustainability of the project will be at stake.

5.2.4 Discontinuity in dredging program:

It is observed that dredging in Gorai was started in 1990 under revenue budget and it continued in the following years though not in massive ways. Massive program was taken up in 1998, 1999 & 2000 by Banshkhali International. Fresh water through Gorai improved that time. But no maintenance dredging was taken up in the successive years until 1996 when this project has started. This gap has brought the project to the point where it was in the Nineties. So it is evident that the maintenance dredging cannot be stopped for any year.

5.2.5 Non-utilization of training expertise

Out of 20 officers of BWDB who got foreign training under the Project, only one (1) officer is now working in the Project. Details have been furnished in para 4.2, Training, Page No. 39 of this Report. This is clearly frustrating and the Project is being deprived of the utilizing the fruits of the training. The officers who got the training may still be posted in the Project.

Main reason

5.2.6 Operation & Maintenance

Operation and maintenance of the two dredgers is the main problem of the project at this moment. Shortage of manpower is the main reason. details has been stated in para 5.2.2

5.2.7 Spoil Management

It is observed that there no specific plan for disposal of dredged soil. Sometime they

are placed at the side of the embankment sometime are dumped for filling ditches and low pockets near the embankment and sometimes on the bed of the river though a bit away from the alignment. So the dredged sections use to be silted up during flood period .

These dredged soil may be used for land development beyond the embankment on the river bank. People should be interested to utilize this soil. But it is learnt that local people generally do not give their land for it though there are so many people who are interested to take this soil for their different purposes. Even in some cases they are willing to pay for the soil as per rule. Sometimes department do not take the initiatives in this connection on the plea of official complicacy.

It has been observed during this year that BWDB is using the soil for resectioning of embankment and then taking up protective works on it at four points. But there is no long program for this work.

Considering all these points, BWDB should identify the weak sections of the embankment first where the re sectioning work is to be done by the dredged soil

And then select other places for placing the same. For this long term plan and program should be prepared for year wise implementation. The program should not be changed year by year. The plan may be prepared in co-operation of IWM.

5.3 Probable Solution:

5.3.1 Option One

The set-up of the Project Director should be need based and thus revised. The recruitment of the staffs particularly the mechanical personnel should be made against this. There is a plea that no manpower is available in this pay scale. If it is practical fact, it must be sorted out. Special pay scale may be introduced. Engagement on contract may also be investigated. After the engagement, the manpower should be regularly trained at BWDB training Institute or at any approved institute.

5.3.2 Option two

The manpower should be engaged by outsourcing .The schedule of work will comprise of maintenance dredging work for specific period of the year and maintenance of dredgers throughout the year. The set-up of the Project Director must include 1 (one) Executive Engineer (Mechanical), 1 (one) Sub-Divisional Engineer (Mechanical) and 2 (two) Sectional Officers to supervise and monitor the works by the outsourcing.

Chapter 6

Recommendations

1. The Maintenance Dredging in Gorai should be continued every year. So it should be included in the routine program of dredging under Revenue Budget rather than implemented under this Project. Because the fund in both the cases are coming from the same source.
2. Maintenance Dredging should be started in proper time and not later than October every year.
3. Subject to clearance from the committees formed by BWDB/MoWR for checking the specification, the taking over of the 2 nos. dredgers should be settled without any further delay.
4. The dredgers are being used in the Project before taking over. Care should be taken so that no litigation arises out of it.
5. The Training to be imparted to the mechanical personnel of BWDB by the supplier should immediately be completed under the Contract. The Project Director will place the personnel without any delay.
6. The operation & maintenance of the two dredgers is the main problem of the Project. There is not sufficient manpower for it. The dredgers may be run by engagement of required manpower through outsourcing. The work schedule will include Maintenance Dredging works for specific period and maintenance of dredgers throughout the year. It will be cost-effective.
7. Budget for yearly maintenance dredging should be ensured when the Project is in the Development Budget and when it comes in the Revenue Budget.
8. At the time of nominating officers for any foreign training, special emphasis should be given that the officers are taken from the Project in question and not from other Projects, the Retirement age and Promotion so that no officer go on PRL and other posting after getting training and the officers are not transferred from the Project after the training.
9. During FGD meetings, the public particularly of Khoksha and Kumarkhali was complaining that the erosion on the river bank was being caused due to dredging. IWM has already done the study which indicates that approximately 0.8 m to 1.0 m erosion may take place for 50 km of Gorai downstream. This covers Kumarkhali and Khoksha. This would not mitigate the grievances of the people of these two (2) Upazillas. BWDB should investigate with IWM whether there is any other reason for this erosion. It should be investigated by IWM and Project Authority into the fact whether the erosion is due to dredging.
10. Regular and close monitoring should always be made so that the objective of the project is achieved, If any bottleneck is found it should be sorted out.
11. Spoil management should be taken seriously. There should be detail and long term plan for depositing the dredged soil.
12. BWDB should maintain close contact with Forest Department, Khulna WASA and Public Health Engineering for monitoring of salinity and other parameters for assessment of environmental condition of Khulna and bio-diversity of Sundarban Reserved Forest.

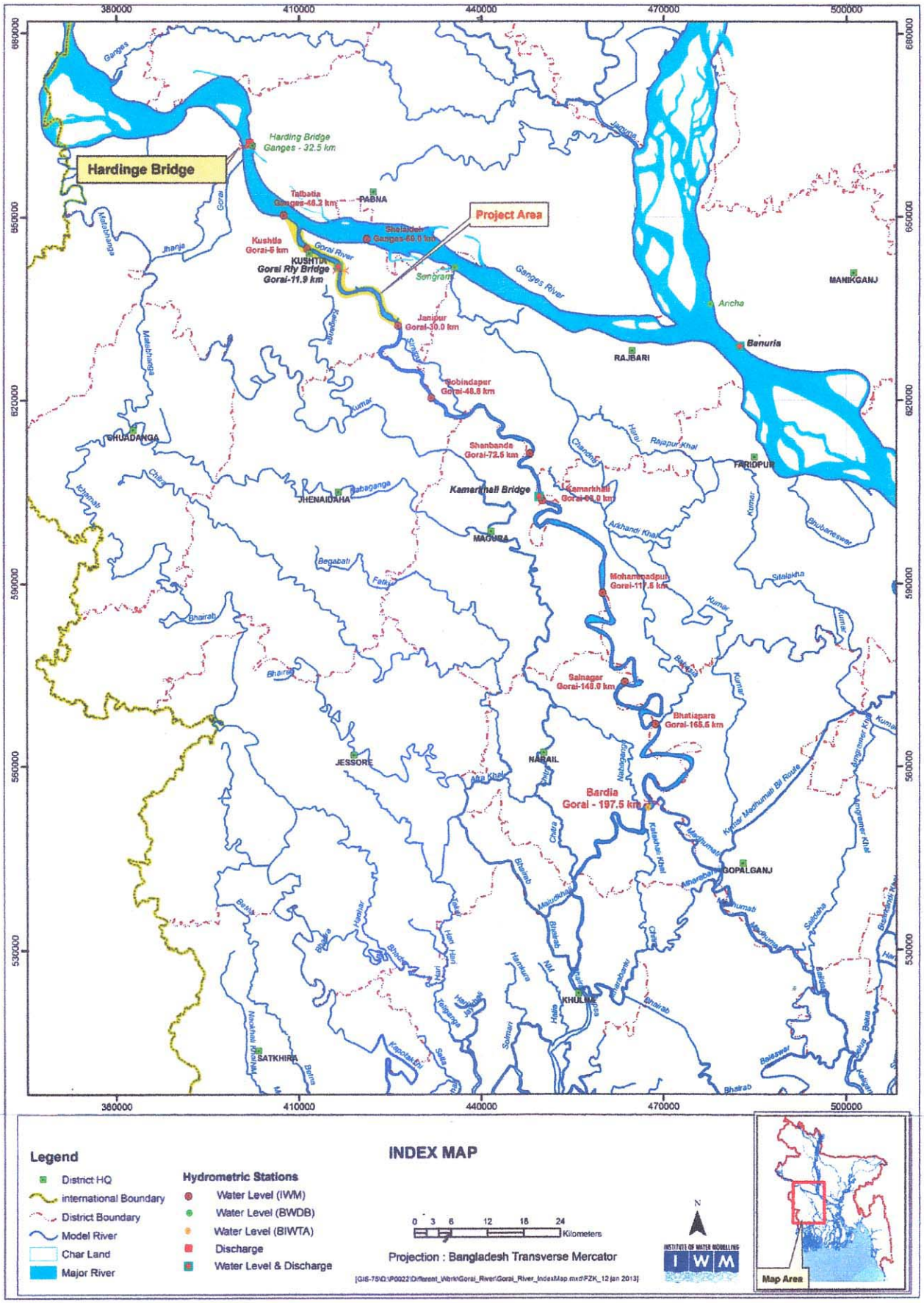


Figure 01: Index Map

Appendix-II

Data Collection Instrument

(Attachment 1 to 5)

Attachment-1

Mid-term Evaluation

of

Gorai River Restoration Project, Phase-II

প্রকল্পের সুবিধাভোগীদের মতামত প্রাপ্তির লক্ষে প্রশ্নপত্র

ভূমিকাঃ- আসসালামু আলাইকুম। আমরা পরিকল্পনা মন্ত্রণালয়ের আই, এম, ই, ডি, এর পক্ষ থেকে মাঠ পর্যায়ে মূল্যায়ন জরিপের উদ্দেশ্যে এসেছি। আপনারা জানেন, বাংলাদেশ পানি উন্নয়ন বোর্ড কর্তৃক ২০০৯-২০১৪ সালে গড়াই নদী পুন: চালু করণ প্রকল্প, ২য় পর্যায় নামে একটি প্রকল্পের কাজ বাস্তবায়িত হচ্ছে। এ প্রকল্পের মূল উদ্দেশ্য হলো গড়াই নদী পুন: চালুকরণ: বর্ষা মৌসুমে Fresh পানি প্রবাহ নিশ্চিত করা এবং শুষ্ক মৌসুমে পানি প্রবাহ বৃদ্ধি করার মাধ্যমে দেশের দক্ষিণ-পশ্চিমাঞ্চলে বিশেষত: খুলনা, উপকূলীয় অঞ্চল এবং সুন্দরবনে পরিবেশগত অধো:গতি রোধ করা। প্রকল্পের মূল লক্ষ্য হলো খূলনার ভূ-পরিস্থ পানির লবণাক্ততা ০১ পিপিটি এর মধ্যে নিয়ে আসা, সুন্দরবন সংরক্ষিত বনাঞ্চলের সম্পদ রক্ষা কল্পে গড়াই নদী ও সুন্দরবনের সংশ্লিষ্ট পানিপথগুলোর লবণাক্ততা ২০ পিপিটি এর মধ্যে কমানো, গড়াই নদীর পানি প্রবাহ বৃদ্ধি করত: মাছের Migration ও উৎপাদন বৃদ্ধি, এবং নদীর নাব্যতা বৃদ্ধি করা খূলনা ও মঙ্গলা বন্দরের বর্জ্য দ্রবণের মাধ্যমে Pollution দূর করা, ভূ-পরিস্থ ও ভূ-গর্ভস্থ পানি সরবরাহ বৃদ্ধি করা, গৃহকার্যে ব্যবহার্য পানির মান উন্নয়ন করা এবং এ লক্ষ্য অর্জনে কতটুকু সহায়ক হয়েছে তা মনিটর করা। এ প্রসঙ্গে আপনাদের মূল্যবান তথ্য বর্তমান প্রকল্প মূল্যায়নে বিশেষ ভূমিকা রাখবে। এ ব্যাপারে আপনার আন্ত্মরিক সহযোগিতা একান্ত্মভাবে কাম্য।

এখানে আরও উল্লেখ্য যে, আপনার মতামত শুধুমাত্র গবেষণার কাজে ব্যবহৃত হবে এবং আপনার দেয়া তথ্য সম্পূর্ণ গোপন রাখা হবে। **(প্রশ্নগুলো প্রকল্পের সুবিধাভোগী তথা কৃষক, নৌকার মাঝি, বালুউত্তোলন কারী ব্যবসায়ী, ও জেলেদের জন্য প্রণয়ন করা হয়েছে। প্রশ্ন নং ১ হতে ৩২ পর্যন্ত সকলের জন্য প্রযোজ্য। পরবর্তী প্রশ্নগুলো শুধুমাত্র নির্দিষ্ট পেশার উত্তর দাতাদের জন্য প্রযোজ্য)।**

উত্তরদাতার নাম ঃ

বয়সঃ

স্বামী/পিতার নাম ঃ

গ্রাম ঃ **ইউনিয়ন ঃ** **উপজেলা ঃ** **জেলা ঃ**

১-৩২ নং প্রশ্নগুলো সবার জন্য প্রযোজ্য

১।	উত্তরদাতার পেশা	○ কৃষক/কৃষিজীবি ○ মৎস্যজীবি ○ নৌকার মাঝি ○ বালু ব্যবসায়ী
২।	২০০৯ সালে আপনার মাসিক পারিবারিক আয় কত ছিল?	টাকা
৩।	গত ২০০৯ সালে আপনার মাসিক আয় কত ছিল?	টাকা
৪।	গত ২০০৯ সালে আপনার মাসিক ব্যয় কত ছিল?	টাকা
৫।	গত ২০১৩ সালে আপনার মাসিক পারিবারিক আয় কত ছিল?	টাকা
৬।	গত ২০১৩ সালে আপনার মাসিক পারিবারিক ব্যয় কত ছিল?	টাকা
৭।	গত ২০১৩ সালে আপনার মাসিক আয় কত ছিল?	টাকা
৮।	মাসিক আয়ের এ হ্রাস/বৃদ্ধির কারন কি?	
৯।	আপনার ছেলেমেয়েরা স্কুলে/কলেজে পড়াশুনা করে কি না?	○ হাঁ ○ না
১০।	যদি পড়াশুনা না করে তবে কি করে?	○ আপনাকে কাজে সাহায্য করে ○ অন্যত্র কাজ করে ○ কি করছে নির্দিষ্ট করে উল্লেখ করুন
১১।	খাবার পানি ও নিত্য প্রয়োজনীয় কাজের জন্য আপনি কোন পানি ব্যবহার করেন?	○ গড়াই নদীর পানি ○ টিউব ওয়েলের পানি ○ পুকুর/বিলের পানি ○ কুয়ার পানি

১২।	আপনারা যে পানি পান করেন তাতে লবনাক্ততা আছে কি না?	○ হাঁ ○ না
১৩।	গড়াই পানিতে লবনাক্ততা আছে কি না?	○ হাঁ ○ না
১৪।	লবনাক্ততার বিষয়টি আপনি কিভাবে বুঝতে পারেন?	
১৫।	লবনাক্ত পানি গ্রহণের ফলে শারীরিকভাবে কোন অসুবিধার সম্মুখীন হচ্ছে কিনা ?	○
১৬।	লবনাক্ত পানি ব্যবহারের ফলে ফসল উৎপাদনে কোন অসুবিধার সম্মুখীন হচ্ছে কিনা ?	○
১৭।	বর্তমানে খরা মৌসুমে টিউবওয়েলের পানি পাওয়া যায় কি না?	○ হাঁ ○ না
১৮।	২০০৯ সালের আগে খরা মৌসুমে টিউবয়েলের পানি পাওয়া যেত কিনা?	○ হাঁ ○ না
১৯।	গড়াই ড্রেজিং কাজের কারণে ২০১৩ সাল পর্যন্ব পূর্বের চাইতে কর্মের সুযোগ	○ বৃদ্ধি পেয়েছে ○ একই রকম আছে। ○ হ্রাস পেয়েছে।
২০।	আপনার মতে কাজের সুযোগ এরূপ বৃদ্ধি/হ্রাসের কারন কি?	○ ○
২১।	ড্রেজিংকৃত মাটি কোথায় ফেলা/রাখা হয়েছে?	○ ○
২২।	আপনার মতে এ মাটি কোথায় ফেলা হলে ভাল হত?	○ ○
২৩।	এ মাটি নদীর পাড়ের উপরে বাঁধে কিংবা পার্শ্বে ফেলার জন্য জায়গা পাওয়া যেত কি?	○ ○
২৪।	আপনি এ মাটি আপনার নিজস্ব কোন কাজ তথা নীচু জায়গা ভরাট কিংবা অন্য কোন কাজে নেওয়ার জন্য আগ্রহী ছিলেন কি?	○ হ্যাঁ ○ না
২৫।	○ উত্তর হ্যাঁ হলে, পাউবো এর কাছে এ মাটি চেয়েছিলেন কি?	○ হ্যাঁ ○ না
২৬।	উত্তর হ্যাঁ হলে, মাটি চেয়ে পেয়েছেন কি?	○ হ্যাঁ ○ না
২৭।	উত্তর হ্যাঁ হলে, কাউকে মাটির দাম দিতে হয়েছে কি?	○ হ্যাঁ ○ না
২৮।	উত্তর হ্যাঁ হলে, ড্রেজিংকৃত মাটি পাওয়ার জন্য কর্তৃপক্ষকে কি হারে মাটির দাম দিতে হয়েছে?	○ ○
২৯।	যদি মাটি না পেয়ে থাকেন তবে তারা আপনাকে কি কারণে মাটি দেয় নি? কি উত্তর দিয়েছে?	○ ○
৩০।	মাটি ফেলার জন্য লোকজন বাঁধের উপরে কিংবা বাঁধের পার্শ্বে নদীর পাড়ে জায়গা দেওয়ার জন্য রাজি আছে কি?	○ ○
৩১।	প্রকল্প চলার কারণে এলাকায় কি কি উপকার হয়েছে বলে আপনি মনে করেন?	○ ○
৩২।	প্রকল্প কাজ চলার কারণে এলাকায় কোন অসুবিধা হয়েছে কিনা?	○ ○

পরবর্তী প্রশ্নগুলো পেশাজীবী অনুযায়ী তথ্য সংগ্রহ করার জন্য

(ক) কৃষকের জন্য প্রশ্ন ঃ

৩৩।	কৃষকের বর্তমান অবস্থা	○ নিজের জমি নিজে চাষ করেন ○ নিজের জমি বর্গা দেন ○ বর্গা চাষী ○ ভূমিহীন
৩৪।	কৃষি কাজে কোথা থেকে সেচের পানি পাওয়া যায়।	○ গড়াই নদী থেকে এল এল পি এর মাধ্যমে ○ জি-কে প্রকল্প হতে ○ টিউবওয়েল হতে ○ অন্যান্য
৩৫।	২০০৯ সালে জমিতে কয়টি ফসল উৎপাদন করতেন?	○ ১টি ○ ২টি ○ ৩টি
৩৬।	২০১৩ সালে জমিতে কয়টি ফসল উৎপাদন করেছেন?	○ ১টি ○ ২টি ○ ৩টি
৩৭।	২০০৯ সালের পর হতে ফসল উৎপাদনের অবস্থা কিরুপ?	○ বৃদ্ধি পেয়েছে ○ একই আছে ○ হ্রাস পেয়েছে
৩৮।	২০১৩ সালের ফসল উৎপাদনের অবস্থা কিরুপ?	○ বৃদ্ধি পেয়েছে ○ একই আছে ○ হ্রাস পেয়েছে
৩৯।	আপনার মতে ফসল উৎপাদন হ্রাস/বৃদ্ধির কারন কি?	○ ○

(খ) নৌকার মাঝিদের জন্য প্রশ্ন ঃ

৪০।	বর্তমানে অর্থাৎ ২০১৩ সালে গড়াই নদীতে খরার সময়ে পানি প্রবাহ থাকে কি না?	○ হাঁ ○ না
৪১।	খরার সময় লোকজন নদী পার হয় কি উপায়ে?	○ খেয়া নৌকায় ○ হেঁটে ○ বাঁশের সাকোর সাহায্যে
৪২।	যদি হেটে পার হয় এর কারন কি?	○ ○
৪৩।	বর্তমানে শুষ্ক মৌসুমে গড়াই নদীতে যে পানি থাকে, তা নৌ চলাচল এর জন্য উপযোগী কিনা?	○ হাঁ ○ না
৪৪।	শুষ্ক মৌসুমে গড়াই নদীতে পানি বৃদ্ধির ফলে বিশেষতঃনৌ চলাচলের কারনে নৌকার মাঝিদের কর্মসংস্থানের অবস্থা কিরুপ?	○ বৃদ্ধি পেয়েছে ○ একই রকম আছে।

(গ) বালু উত্তোলনকারী ব্যবসায়ীদের জন্য প্রশ্ন ঃ

৪৫।	২০১৩ সালে শুষ্ক মৌসুমে গড়াই নদী হতে বালু উত্তোলনের পরিমাণ কিরুপ?	○ বৃদ্ধি পেয়েছে ○ একই রকম আছে। ○ হ্রাস পেয়েছে।
৪৬।	আপনার মতে বালু উত্তোলন হ্রাস/ বৃদ্ধির কারন কি?	○ ○
৪৭।	২০১৩ সালে শুষ্ক মৌসুমে গড়াই নদী হতে উত্তোলিত বালু পরিবহনের অবস্থা কিরুপ ছিল?	○ বৃদ্ধি পেয়েছে ○ একই রকম আছে। ○ হ্রাস পেয়েছে।
৪৮।	আপনার মতে উত্তোলিত বালু পরিবহনের হ্রাস/ বৃদ্ধির কারন কি?	○ ○
৪৯।	গড়াই নদী হতে ড্রেজিংকৃত বালু উত্তোলনের সাথে নতুন কর্মসংস্থানের সুযোগ সৃষ্টি হয়েছে কিনা?	○ বৃদ্ধি হয়েছে ○ একই রকম আছে। ○ হ্রাস পেয়েছে।

৫০।	আপনার মতে বালু উত্তোলনের সাথে কর্মসংস্থান হ্রাস/বৃদ্ধির কারন কি?	○ ○
৫১।	গড়াই নদী হতে ড্রেজিংকৃত বালু পরিবহনের সাথে নতুন কর্মসংস্থানের সুযোগ সৃষ্টি হয়েছে কিনা?	○ বৃদ্ধি হয়েছে ○ একই রকম আছে। ○ হ্রাস পেয়েছে।
৫২।	আপনার মতে বালু পরিবহনের সাথে কর্মসংস্থান হ্রাস/বৃদ্ধির কারন কি?	○ ○

(ঘ) জেলেদের জন্য প্রশ্ন ঃ

৫৩।	২০০৯ সালের পরবর্তীতে শুষ্ক মৌসুমে গড়াই নদীতে পানি বৃদ্ধির ফলে মৎস্য চাষে কর্মসংস্থানের সুযোগ সৃষ্টির অবস্থা কি?	○ বৃদ্ধি পেয়েছে ○ একই রকম আছে। ○ হ্রাস পেয়েছে।
৫৪।	আপনার মতে মৎস্য চাষে কর্মসংস্থানের হ্রাস/বৃদ্ধির কারণ কি?	○
৫৫।	২০০৯ সাল হতে মৎস্য উৎপাদনের পরিমাণ কিরুপ আছে?	○ বৃদ্ধি পেয়েছে ○ হ্রাস পেয়েছে।
৫৬।	২০১৩ সালে মৎস্য উৎপাদনের পরিমাণ কিরুপ ?	○ বৃদ্ধি পেয়েছে ○ হ্রাস পেয়েছে।
৫৭।	আপনার মতে মৎস্য উৎপাদন হ্রাস/বৃদ্ধির কারণ কি?	○

সাক্ষাৎকার গ্রহণকারীর নাম ঃ	
স্বাক্ষর ঃ	সাক্ষাৎকার গ্রহণের তারিখ ঃ
তদারক কারীর নাম ঃ	
স্বাক্ষর ঃ	তারিখ ঃ

Attachment-2

Mid-term Evaluation
of
Gorai River Restoration Project, Phase-II

প্রকল্পের কর্মকর্তাগণের সঙ্গে নিবিড় আলোচনার জন্য প্রশ্নপত্র/গাইডলাইন

ভূমিকাঃ- আসসালামু আলাইকুম। আমরা পরিকল্পনা মন্ত্রণালয়ের আই, এম, ই, ডি, এর পক্ষ থেকে মাঠ পর্যায়ে মূল্যায়ন জরিপের উদ্দেশ্যে এসেছি। আপনারা জানেন, বাংলাদেশ পানি উন্নয়ন বোর্ড কর্তৃক ২০০৯-২০১৪ সালে গড়াই নদী পুন: চালু করণ প্রকল্প, ২য় পর্যায় নামে একটি প্রকল্পের কাজ বাস্তবায়িত হচ্ছে। এ প্রকল্পের মূল উদ্দেশ্য হলো গড়াই নদী পুন: চালুকরণ: বর্ষা মৌসুমে Fresh পানি প্রবাহ নিশ্চিত করা এবং শুষ্ক মৌসুমে পানি প্রবাহ বৃদ্ধি করার মাধ্যমে দেশের দক্ষিণ-পশ্চিমাঞ্চলে বিশেষত: খুলনা, উপকূলীয় অঞ্চল এবং সুন্দরবনে পরিবেশগত অধো:গতি রোধ করা। প্রকল্পের মূল লক্ষ্য হলো খুলনার ভূ-পরিস্থ পানির লবণাক্ততা ০১ পিপিটি এর মধ্যে নিয়ে আসা, সুন্দরবন সংরক্ষিত বনাঞ্চলের সম্পদ রক্ষা কল্পে গড়াই নদী ও সুন্দরবনের সংশ্লিষ্ট পানিপথগুলোর লবণাক্ততা ২০ পিপিটি এর মধ্যে কমানো, গড়াই নদীর পানি প্রবাহ বৃদ্ধি করত: মাছের Migration ও উৎপাদন বৃদ্ধি, এবং নদীর নাব্যতা বৃদ্ধি করা খুলনা ও মঙ্গলা বন্দরের বর্জ্য দ্রবণের মাধ্যমে Pollution দূর করা, ভূ-পরিস্থ ও ভূ-গর্ভস্থ পানি সরবরাহ বৃদ্ধি করা, গৃহকার্যে ব্যবহার্য পানির মান উন্নয়ন করা এবং এ লক্ষ্য অর্জনে কতটুকু সহায়ক হয়েছে তা মনিটর করা। এ প্রসঙ্গে আপনাদের মূল্যবান তথ্য বর্তমান প্রকল্প মূল্যায়নে বিশেষ ভূমিকা রাখবে। এ ব্যাপারে আপনার আন্তরিক সহযোগিতা একান্তভাবে কাম্য।

(প্রকল্পের প্রকল্প পরিচালক ও নির্বাহী প্রকৌশলী এর জন্য। সংশ্লিষ্ট কর্মকর্তার নিম্নে উল্লিখিত প্রশ্নগুলো তাঁর জন্য প্রযোজ্য)

পরিচিতি	
উত্তরদাতার নাম ঃ	**পদবী ঃ**

(ক) প্রকল্প পরিচালকের জন্যঃ

১।	কত দিন এবং কোন পদমর্যাদা নিয়ে এ কার্যক্রমের সঙ্গে সম্পৃক্ত ছিলেন/আছেন?
	• সময়কাল (বছর) • পদমর্যাদা

২।	আপনার প্রকল্পে মোট কতগুলো প্যাকেজ এবং প্রতিটি প্যাকেজে কতটি করে লট আছে?

৩।	তন্মধ্যে কতটি সম্পন্ন হয়েছে?

* পিপিআর-২০০৮ অনুযায়ী মালামাল/সেবা ক্রয় সংক্রান্ত তথ্যাবলী:

(১)	মন্ত্রনালয়/বিভাগ	
(২)	বাস্তবায়ন সংস্থাকারী	
(৩)	প্রকল্পের নাম	
(৪)	ক্রয় পদ্ধতি	
(৫)	দরপত্র অনুযায়ী কাজের নাম	
(৬)	দরপত্র প্রকাশিত পত্রিকার নাম	
(৭)	দরপত্র বিক্রয় শুরূন্নর তারিখ	
(৮)	দরপত্র বিক্রয়ের শেষ তারিখ ও সময়	
(৯)	দরপত্র গ্রহণের শেষ তারিখ ও সময়	
(১০)	প্রাপ্ত মোট দরপত্র সংখ্যা	
(১১)	দরপত্র খোলার তারিখ ও সময়। দরপত্র মূল্যায়ন কমিটির কোন সদস্য উপস্থিত ছিলেন কিনা?	
(১২)	রেপসনসিভ দরপত্রের সংখ্যা	
(১৩)	নন-রেপসনসিভ দরপত্রের সংখ্যা ও কারণ	
(১৪)	দরপত্র মূল্যায়ন কমিটিতে নিজস্ব সংস্থার বাহিরের সদস্য সংখ্যা কতজন ছিল?	
(১৫)	দরপত্র মূল্যায়ন কমিটির সভার তারিখ	
(১৬)	কার্যবিবরণী অনুমোদনের তারিখ	
(১৭)	সি এস তৈরির তারিখ	
(১৮)	সি এস অনুমোদনের তারিখ	
(১৯)	Notification of Award প্রদানের তারিখ	
(২০)	মোট চুক্তিমূল্য	
(২১)	চুক্তি স্বাক্ষরের তারিখ	
(২২)	কার্যাদেশ প্রদানের তারিখ	
(২৩)	কার্যাদেশ অনুযায়ী কাজ শুরূন্নর তারিখ	

(২৪)	সময় বৃদ্ধি হয়ে থাকলে, কতদিন বৃদ্ধি এবং কারন	
(২৫)	কার্যাদেশ অনুযায়ী কাজ সমাপ্তির তারিখ	
(২৬)	চুড়ান্ত বিল জমাদানের তারিখ ও বিলের পরিমান	
(২৭)	চুড়ান্ত বিল পরিশোধের তারিখ ও পরিমান	

৪।	প্রকল্পে এ পর্যন্ত বৎসর ওয়ারী যে ড্রেজিং কাজ হয়েছে তা বাস্তবায়নকারী প্রতিষ্ঠানের নাম সহ উল্লেখ করুন।			
	বৎসর	ড্রেজিং এর পরিমান		বাস্তবায়নকারী প্রতিষ্ঠান
		কিঃ মিঃ	কিউমেক (মাটি)	

৫।	প্রকল্পে Procurement specialist নেয়ার কারণ কি? তিনি কি কাজ করেছেন?

৬।	ড্রেজকৃত মাটির পরিমাপের দায়িত্বে কে আছেন?

৭।	সরবরাহ প্রতিষ্ঠান কর্তৃক ড্রেজার ২টি কবে প্রকল্প কর্তৃপক্ষের নিকট হস্তান্তর করা হয়েছে কি?

৮।	ক্রয়কৃত ড্রেজার দুইটি বর্তমানে কোথায় রাখা হয়েছে?

৯।	ড্রেজার দুইটি পরিচালনা ও রক্ষানাবেক্ষন করার জন্য কত জন লোকবলের প্রয়োজন? কত জন আছে?

১০।	প্রকল্প সমাপ্তির পর গড়াই নদীর নাব্যতা বজায় রাখার জন্য কি কার্যক্রম গ্রহণ করা প্রয়োজন? কত টাকার প্রয়োজন হবে প্রতিবছর?

১১।	বর্তমানে যে জনবল হয়েছে তার নিয়ন্ত্রণকারী কর্মকর্তা কে?
	• প্রকল্প পরিচালক • ড্রেজার পরিদপ্তর

১২।	প্রকল্প সমাপ্তির পর সংগ্রহকৃত ড্রেজার দুটি কার তত্বাবধানে রাখা হবে?

১৩।	সরবরাহ প্রতিষ্ঠান কর্তৃক প্রকল্পের জনবলকে প্রশিক্ষণ প্রদান করার কথা। সে প্রশিক্ষণ হয়েছে কি?
১৪।	প্রকল্পের Flow Divider এবং Guide Bundh এর কাজ অদ্যাবধি শুরু না করার কারণ কি?

১৫।	বর্তমান বছরে গড়াই ড্রেজিং কাজ শুরু হয়েছে কি? না হয়ে থাকলে কারণ কি?

১৬।	ডেজকৃত মাটি এলাইনমেন্টের বাইরে কত দূবত্বে ফেলা হচ্ছে। কত দূরে ফেলার নির্দেশনা আছে।

১৭।	DPP প্রণয়নের সময় ডিজাইন পরিদপ্তর অথবা কোন বিশেষজ্ঞের সাথে আলোচনা করে মাটি ফেলার স্থান নির্ধারণ করা হয়েছে কিনা ?

১৮।	প্রকল্পের আওতায় প্রশিক্ষণ কর্মসূচী আছে কি?

১৯।	এ প্রশিক্ষণের আওতায় কতজনের সংস্থানের অনুকূলে কতজনের প্রশিক্ষন সম্পন্ন হয়েছে?

২০।	এ প্রশিক্ষণ প্রকল্পের কাজে কতটুকু সহায়ক হয়েছে বলে আপনি মনে করেন?

২১।	প্রকল্পের আওতায় প্রশিক্ষণ প্রাপ্ত জনবলের কতজন বর্তমানে প্রকল্পে কর্মরত আছেন ?

২২।	প্রকল্পের মূল উদ্দেশ্য হলো দেশের দক্ষিণ-পশ্চিমাঞ্চলের লবণাক্ততা সুন্দরবনের সংশ্লিষ্ট নদীতে ২০ পিপিটি এবং খুলনায় ১ পিপিটির মধ্যে কমিয়ে আনা। লবণাক্ততার পরিমাণ এরূপ নির্ধারণ করার কারণ কি? এটা কিভাবে মনিটর করা হচ্ছে?

২৩।	প্রকল্প বাস্তবায়নের ফলে প্রকল্পের ভূ-গর্ভস্থ এবং ভূ-উপরিস্থ ওয়াটার লেবেল বৃদ্ধির কথা বলা হয়েছে। এটা কি ভাবে মনিটর করছেন?

২৪।	২০১৪ এর জুনে প্রকল্পের বাস্তবায়ন সম্পন্ন হবে বলে আপনি মনে করেন কি?

২৫।	যদি উত্তর না সূচক হয়, সে ক্ষেত্রে কোন কারণগুলিকে আপনি প্রধান অন্তরায় বলে মনে করেন?

(খ) নির্বাহী প্রকৌশলী (পুর) এর জন্যঃ

২৬।	প্রকল্পে আপনার মূল দায়িত্ব কি?

২৭।	ড্রেজার দুটির ক্ষমতা (প্রতিটি ড্রেজার প্রতি ঘন্টায় কত ঘনমিটার মাটি কাটে) কত? প্রকৃত অবস্থায় ড্রেজার দুটি দ্বারা কত ঘন মিটার মাটি কাটা সম্ভব হচ্ছে? ড্রেজার দুটি প্রতিদিন কত ঘন্টা চালানো হয়? প্রতি ঘন্টায় জ্বালানী ব্যবহারের পরিমাণ কত লিটার?

২৮।	ড্রেজিং কাজ Specification অনুযায়ী হচ্ছে কি না সে ব্যাপারে আপনি কি ভাবে মনিটর করছেন?

২৯।	ড্রেজিংকৃত মাটি কোথায় ফেলা হচ্ছে? এ নির্দেশনা কে দিচ্ছেন?

(গ) নির্বাহী প্রকৌশলী (যান্ত্রিক) এর জন্যঃ

৩০।	প্রকল্পে সরবরাহকৃত ড্রেজার ২টি পরিচালনার দায়িত্বে আপনি আছেন কি?

৩১।	ড্রেজার পরিচালনা ও রক্ষনাবেক্ষনের জন্য কত জনবল প্রয়োজন ? বর্তমানে আছে কতজন?

৩২।	ড্রেজার দুইটি পরিচালনায় বর্তমানে কোন সমস্যা আছে কি ?

৩৩।	ড্রেজার ২টি বর্তমানে কোথায় আছে? তাদের সঠিক রক্ষনাবেক্ষন হচ্ছে কি ?

সাক্ষাৎকার গ্রহণকারীর নাম	
স্বাক্ষর ঃ	সাক্ষাৎকার গ্রহণের তারিখ ঃ
তদারক কারীর নাম ঃ	
স্বাক্ষর ঃ	তারিখ ঃ

Attachment-3

Mid-term Evaluation

of

Gorai River Restoration Project, Phase-II

প্রকল্পের পরামর্শকগণের সঙ্গে নিবিড় আলোচনার জন্য গাইডলাইন

ভূমিকাঃ- আসসালামু আলাইকুম। আমরা পরিকল্পনা মন্ত্রণালয়ের আই, এম, ই, ডি, এর পক্ষ থেকে মাঠ পর্যায়ে মূল্যায়ন জরিপের উদ্দেশ্যে এসেছি। আপনারা জানেন, বাংলাদেশ পানি উন্নয়ন বোর্ড কর্তৃক ২০০৯-২০১৪ সালে গড়াই নদী পুন: চালু করণ প্রকল্প, ২য় পর্যায় নামে একটি প্রকল্পের কাজ বাস্তবায়িত হচ্ছে। এ প্রকল্পের মূল উদ্দেশ্য হলো গড়াই নদী পুন: চালুকরণ: বর্ষা মৌসুমে Fresh পানি প্রবাহ নিশ্চিত করা এবং শুষ্ক মৌসুমে পানি প্রবাহ বৃদ্ধি করার মাধ্যমে দেশের দক্ষিণ-পশ্চিমাঞ্চলে বিশেষত: খুলনা, উপকূলীয় অঞ্চল এবং সুন্দরবনে পরিবেশগত অধো:গতি রোধ করা। প্রকল্পের মূল লক্ষ্য হলো খূলনার ভূ-পরিস্থ পানির লবণাক্ততা ০১ পিপিটি এর মধ্যে নিয়ে আসা, সুন্দরবন সংরক্ষিত বনাঞ্চলের সম্পদ রক্ষা কল্পে গড়াই নদী ও সুন্দরবনের সংশ্লিষ্ট পানিপথগুলোর লবণাক্ততা ২০ পিপিটি এর মধ্যে কমানো, গড়াই নদীর পানি প্রবাহ বৃদ্ধি করত: মাছের Migration ও উৎপাদন বৃদ্ধি, এবং নদীর নাব্যতা বৃদ্ধি করা খূলনা ও মঙ্গলা বন্দরের বর্জ্য দ্রবণের মাধ্যমে Pollution দূর করা, ভূ-পরিস্থ ও ভূ-গর্ভস্থ পানি সরবরাহ বৃদ্ধি করা, গৃহকার্যে ব্যবহার্য পানির মান উন্নয়ন করা এবং এ লক্ষ্য অর্জনে কতটুকু সহায়ক হয়েছে তা মনিটর করা। এ প্রসঙ্গে আপনাদের মূল্যবান তথ্য বর্তমান প্রকল্প মূল্যায়নে বিশেষ ভূমিকা রাখবে। এ ব্যাপারে আপনার আন্তরিক সহযোগিতা একান্তভাবে কাম্য।

এখানে আরও উল্লেখ্য যে, আপনার মতামত শুধুমাত্র গবেষণার কাজে ব্যবহৃত হবে এবং আপনার দেয়া তথ্য সম্পূর্ণ গোপন রাখা হবে। **(প্রকল্পের পরামর্শকগণের জন্য প্রশ্নগুলো প্রণয়ন করা হয়েছে)**।

উত্তরদাতার নাম ঃ
পদবী ঃ
প্রতিষ্ঠানের নাম ঃ

(ক) IWM এর জন্য প্রযোজ্য ঃ (প্রশ্ন নম্বর ১-৯)

১।	পানি উন্নয়ন বোর্ডের সাথে আপনাদের যে চুক্তি আছে সে অনুযায়ী আপনারা প্রকল্পের কোন কোন কাজে নিয়োজিত আছেন।
২।	ড্রেজিংকৃত মাটি কোথায় ফেলা হচ্ছে?

৩।	এ মাটি নদীর পাড়ে বাঁধের উপরে কিংবা অপর পার্শ্বে ফেলা হলে ভরাটের পরিমাণ অনেক কম হত কি? এটা কেন করা হলো না?

৪।	ড্রেজিংকৃত মাটি পরবর্তী বর্ষা মৌসুমের পরে অনেকটা ভরাট হয়ে যায়? আপনার মতে এ ভরাটের হার কত শতাংশ?

৫।	নিয়মিত ড্রেজিং করা না হলে প্রকল্পের অবস্থা কেমন দাড়াবে?

৬।	নিয়মিত ড্রেজিং কর্মসূচী বৎসরের কোন সময় শুরু ও কোন সময় পর্যন্ত চলমান রাখা উচিত বলে আপনি মনে করেন?

৭।	প্রকল্পের উদ্দেশ্য অর্জনে অর্থাৎ সুন্দরবনে ২০ পিপিটি এবং খুলনায় ১ পিপিটি লবনাক্ততা কমিয়ে আনার বিষয়টি মনিটর করার জন্য আপনারা কি ব্যবস্থা নিয়েছেন?

৮।	পানি উন্নয়ন বোর্ডের সাথে আপনাদের চুক্তি শেষ হয়েছে কি?

৯।	পানি উন্নয়ন বোর্ডের সাথে আপনাদের যে চুক্তি নামা আছে তার মেয়াদ বৃদ্ধির কোন প্রস্তাবনা আছে কিনা?

(খ) Procurement Specialist এর জন্য প্রযোজ্য ঃ (প্রশ্ন ১০-১৬)

১০।	পানি উন্নয়ন বোর্ডের সাথে আপনার যে চুক্তি হয়েছে সে অনুযায়ী আপনি প্রকল্পের কি কি কাজে নিয়োজিত আছেন?

১১।	আপনার চুক্তিনামা কবে শুরু এবং শেষ হবে?

১২।	প্রকল্পে দুটি ড্রেজার ক্রয়ের ক্ষেত্রে ড্রেজারের Specification তৈরি এবং Tender document তৈরিতে আপনার কি ভূমিকা ছিল?

১৩।	প্রকল্পে যে দুটি ড্রেজার সরবরাহ নেওয়া হয়েছে তা Tender document-এর Specification অনুযায়ী হয়েছে কিনা সে ব্যাপারে আপনার মতামত কি ?

১৪।	প্রকল্পে যে দুটি ড্রেজার সরবরাহ নেওয়া হয়েছে তা বর্তমানে প্রকল্পে যে ধরনের ড্রেজিং কাজ হচ্ছে তার জন্য উপযোগী কিনা?

১৫।	প্রকল্পে সরবরাহকৃত ড্রেজার দুটি বর্তমানে যে স্থানে এবং অবস্থায় রাখা হয়েছে তাতে এদের সুষ্ঠু রক্ষণাবেক্ষন হচ্ছে কিনা সে ব্যাপরে আপনার মতামত কি?

১৬।	প্রকল্পে সরবরাহকৃত ড্রেজার দুটি প্রকল্পের কাজে যাতে সুষ্ঠুভাবে ব্যবহার করা যায় সে ব্যাপারে আশু ও দীর্ঘ মেয়াদী করনীয় ব্যবস্থা সম্পর্কে আপনার মতামত কি কি?

সাক্ষাৎকার গ্রহণকারীর নাম ঃ	
স্বাক্ষর ঃ	সাক্ষাৎকার গ্রহণের তারিখ ঃ
তদারক কারীর নাম ঃ	
স্বাক্ষর ঃ	তারিখ ঃ

Attachment-4

Mid-term Evaluation

of

Gorai River Restoration Project, Phase-II

প্রকল্পের ব্যাপারে অন্যান্য প্রতিষ্ঠানের সাথে নিবিড় আলোচনার জন্য গাইডলাইন

ভূমিকাঃ- আসসালামু আলাইকুম। আমরা পরিকল্পনা মন্ত্রণালয়ের আই, এম, ই, ডি, এর পক্ষ থেকে মাঠ পর্যায়ে মূল্যায়ন জরিপের উদ্দেশ্যে এসেছি। আপনারা জানেন, বাংলাদেশ পানি উন্নয়ন বোর্ড কর্তৃক ২০০৯-২০১৪ সালে গড়াই নদী পুন: চালু করণ প্রকল্প, ২য় পর্যায় নামে একটি প্রকল্পের কাজ বাস্তবায়িত হচ্ছে। এ প্রকল্পের মূল উদ্দেশ্য হলো গড়াই নদী পুন: চালুকরণ: বর্ষা মৌসুমে Fresh পানি প্রবাহ নিশ্চিত করা এবং শুষ্ক মৌসুমে পানি প্রবাহ বৃদ্ধি করার মাধ্যমে দেশের দক্ষিণ-পশ্চিমাঞ্চলে বিশেষত: খুলনা, উপকূলীয় অঞ্চল এবং সুন্দরবনে পরিবেশগত অধো:গতি রোধ করা। প্রকল্পের মূল লক্ষ্য হলো খূলনার ভূ-পরিস্থ পানির লবণাক্ততা ০১ পিপিটি এর মধ্যে নিয়ে আসা, সুন্দরবন সংরক্ষিত বনাঞ্চলের সম্পদ রক্ষা কল্পে গড়াই নদী ও সুন্দরবনের সংশ্লিষ্ট পানিপথগুলোর লবণাক্ততা ২০ পিপিটি এর মধ্যে কমানো, গড়াই নদীর পানি প্রবাহ বৃদ্ধি করত: মাছের Migration ও উৎপাদন বৃদ্ধি, এবং নদীর নাব্যতা বৃদ্ধি করা খূলনা ও মঙ্গলা বন্দরের বর্জ্য দ্রবণের মাধ্যমে Pollution দূর করা, ভূ-পরিস্থ ও ভূ-গর্ভস্থ পানি সরবরাহ বৃদ্ধি করা, গৃহকার্যে ব্যবহার্য পানির মান উন্নয়ন করা এবং এ লক্ষ্য অর্জনে কতটুকু সহায়ক হয়েছে তা মনিটর করা। এ প্রসঙ্গে আপনাদের মূল্যবান তথ্য বর্তমান প্রকল্প মূল্যায়নে বিশেষ ভূমিকা রাখবে। এ ব্যাপারে আপনার আন্তরিক সহযোগিতা একান্তভাবে কাম্য।

এখানে আরও উল্লেখ্য যে, আপনার মতামত শুধুমাত্র গবেষণার কাজে ব্যবহৃত হবে এবং আপনার দেয়া তথ্য সম্পূর্ণ গোপন রাখা হবে। (প্রকল্পের উদ্দেশ্য অর্জিত হচ্ছে কিনা সে বিষয়ে আলোচনার জন্য প্রশ্নগুলো প্রণয়ন করা হয়েছে। প্রশ্ন নম্বর ১ ও ২ সকলের জন্য প্রযোজ্য। পাউবো এর ভূ-গর্ভস্থ ও ভূ-পরিস্থ পানি বিজ্ঞান পরিদপ্তর, খুলনা ওয়াসা ও বন বিভাগের সংশ্লিষ্ট কর্মকর্তাবৃন্দের জন্য তাদের নিম্নে বর্ণিত প্রশ্নগুলো প্রযোজ্য)।

উত্তর দাতার নাম ঃ

পদবী ঃ

বিভাগ/প্রতিষ্ঠান ঃ

১।	পানি উন্নয়ন বোর্ডের অধীনে গড়াই নদী পুনর্বাসন প্রকল্প, ২য় পর্যায় নামে একটি প্রকল্প বাস্ত্মবায়িত হচ্ছে। এ ব্যাপারে আপনি অবগত আছেন কি?

২।	১৯৭৫ সালে ফারাক্কা ব্যারেজ চালু হওয়ার প্রেক্ষিতে গঙ্গা ও গড়াই নদীর পানি প্রবাহ অস্বাভাবিক ভাবে হ্রাস পায়। এর ফলে Fresh water-এর সরবরাহ ক্রমাগতভাবে কমতে থাকে এবং এর প্রভাবে দেশের দক্ষিণ- পশ্চিমাঞ্চলের নদ নদী ও নদী পথ গুলোর মাধ্যমে লবনাক্ততার ঊর্ধ্বগতি দেখা দেয়। এতে পরিবেশের উপর বিরূপ প্রতিক্রিয়া দেখা দেয়। এ কারণে উপরে উল্লেখিত প্রকল্প হাতে নেয়া হয়েছে। এ ব্যাপারে আপনি অবগত আছেন কি?

(ক) পরিচালক, ভূ–উপরিস্থ পানি বিজ্ঞান, পাউবো, ঢাকা।

৩।	দেশে দক্ষিণাঞ্চলে গঙ্গা ও গড়াই নদী সিস্টেমে পানির লবণাক্ততা পরিমাপ করার জন্য আপনার অধীনে কোন পরিমাপ স্টেশন আছে কি না । থাকলে, স্টেশনগুলো কি কি ? এ স্টেশনগুলোতে কতদিন অন্ত্মর অন্ত্মর লবনাক্ততা পরিমাপ করা হয়?

৪।	২০০৯ সালের পরবর্তীতে এ অঞ্চলের লবনাক্ততা হ্রাস/বৃদ্ধির ব্যাপারে আপনাদের কোন সমীক্ষা করা হয়েছে কি? যদি হয়ে থাকে তাতে ফলাফল কি দেখা যায় ?

৫।	লবনাক্ততা হ্রাস/বৃদ্ধির কি কারণ আছে বলে আপনি মনে করেন ?

৬।	২০০৯ সাল পরবর্তী সময়ে এ অঞ্চলে বিশেষত গড়াই অধ্যুষিত এলাকায় ভূ-উপরিস্থ ওয়াটার লেবেল বৃদ্ধি পেয়েছে/নিচে নেমে গেছে? এ ব্যাপারে কোন সমীক্ষা করা হয়েছে কি?

(খ) পরিচালক, ভূ-গর্ভস্থ পানি বিজ্ঞান, পাউবো, ঢাকা।

৭।	দেশের দক্ষিণ-পশ্চিমাঞ্চলে ভূ-গর্ভস্থ ওয়াটার লেবেল পরিমাপের জন্য আপনার অধীনে পরিমাপ স্টেশন আছে কি না? থাকলে, কয়টি এবং কোথায় আছে?

৮।	২০০৯ সালের পরবর্তীতে এ অঞ্চলে ভূ-গর্ভস্থ ওয়াটার লেবেল বৃদ্ধি পেয়েছে/ নিচে নেমে গেছে? এ ব্যাপারে কোন সমীক্ষা করা হয়েছে কি? কি কারণে এ হ্রাস/বৃদ্ধি ঘটেছে বলে আপনি মনে করেন?

গ) সংশ্লিষ্ট কর্মকর্তা, খুলনা ওয়াসা ।

৯।	খুলনা নগরীতে আপনারা যে খাবার পানি সরবরাহ করেন তা পানির কোন উৎস হতে সংগ্রহ করেন। এ পানির লবনাক্ততার পরিমান কত পাওয়া যায়? এ লবনাক্ততা আপনারা কি ভাবে পরিমাপ করেন? বিভাগীয় ভাবে অথবা অন্যকোন উৎস হতে এ তথ্য সংগ্রহ করেন কি ?

ঘ) সংশ্লিষ্ট কর্মকর্তা, বন বিভাগ, খুলনা/ঢাকা প্রধান দপ্তর ।

১০।	সুন্দরবন সংরক্ষিত বনাঞ্চলের সন্নিহিত যে নদ-নদী রয়েছে তার পানিতে লবনাক্ততার কোন পরিমাপ আপনারা করেন কি না? যদি করে থাকেন তবে আপনাদের নিজস্ব পরিমাপ স্টেশন আছে কি না? যদি না থাকে তবে এ তথ্য আপনারা কোথা থেকে সংগ্রহ করেন?

১১।	২০০৯ সালের পরবর্তীতে লবনাক্ততার হ্রাস/বৃদ্ধির কারণে সংরক্ষিত বনাঞ্চলে জীব ও বৈচিত্রের উপর কি ধরনের প্রভাব পড়েছে বলে আপনি মনে করেন? বিশেষত সুন্দরী গাছের উপর এর প্রভাব কি?

সাক্ষাৎকার গ্রহণকারীর নাম ঃ	
স্বাক্ষর ঃ	সাক্ষাৎকার গ্রহণের তারিখ ঃ

Attachment-5

Mid-Term Evaluation

of

Gorai River Restoration Project, Phase-II

FGD সভায় আলোচনা মতামত প্রাপ্তির লক্ষে প্রশ্নপত্র

ভূমিকাঃ- আসসালামু আলাইকুম। আমরা পরিকল্পনা মন্ত্রণালয়ের আই, এম, ই, ডি, এর পক্ষ থেকে মাঠ পর্যায়ে মূল্যায়ন জরিপের উদ্দেশ্যে এসেছি। আপনারা জানেন, বাংলাদেশ পানি উন্নয়ন বোর্ড কর্তৃক ২০০৯-২০১৪ সালে গড়াই নদী পুন: চালু করণ প্রকল্প, ২য় পর্যায় নামে একটি প্রকল্পের কাজ বাস্তবায়িত হচ্ছে। এ প্রকল্পের মূল উদ্দেশ্য হলো গড়াই নদী পুন: চালুকরণ: বর্ষা মৌসুমে Fresh পানি প্রবাহ নিশ্চিত করা এবং শুষ্ক মৌসুমে পানি প্রবাহ বৃদ্ধি করার মাধ্যমে দেশের দক্ষিণ-পশ্চিমাঞ্চলে বিশেষত: খুলনা, উপকূলীয় অঞ্চল এবং সুন্দরবনে পরিবেশগত অধো:গতি রোধ করা। প্রকল্পের মূল লক্ষ্য হলো খূলনার ভূ-পরিস্থ পানির লবণাক্ততা ০১ পিপিটি এর মধ্যে নিয়ে আসা, সুন্দরবন সংরক্ষিত বনাঞ্চলের সম্পদ রক্ষা কল্পে গড়াই নদী ও সুন্দরবনের সংশ্লিষ্ট পানিপথগুলোর লবণাক্ততা ২০ পিপিটি এর মধ্যে কমানো, গড়াই নদীর পানি প্রবাহ বৃদ্ধি করত: মাছের Migration ও উৎপাদন বৃদ্ধি, এবং নদীর নাব্যতা বৃদ্ধি করা খূলনা ও মঙ্গলা বন্দরের বর্জ্য দ্রবণের মাধ্যমে Pollution দূর করা, ভূ-পরিস্থ ও ভূ-গর্ভস্থ পানি সরবরাহ বৃদ্ধি করা, গৃহকার্যে ব্যবহার্য পানির মান উন্নয়ন করা এবং এ লক্ষ্য অর্জনে কতটুকু সহায়ক হয়েছে তা মনিটর করা। এ প্রসঙ্গে আপনাদের মূল্যবান তথ্য বর্তমান প্রকল্প মূল্যায়নে বিশেষ ভূমিকা রাখবে। এ ব্যাপারে আপনার আন্তরিক সহযোগিতা একান্তভাবে কাম্য।

(উপজেলা নির্বাহী কর্মকর্তা (ইউ এন ও), উপজেলা কৃষি কর্মকর্তা, মৎস্য কর্মকর্তা, স্থানীয় ইউনিয়ন পরিষদ চেয়ারম্যান/সদস্য, স্থানীয় রাজনীতিবিদ, স্থানীয় প্রশাসন ও আইন-শৃঙ্খলা বাহিনীর সদস্য, শিক্ষক ও চাকুরীজীবি এবং প্রকল্পের সুবিধাভোগী তথা কৃষক, জেলে, মাঝি ও ব্যবসায়ী প্রভৃতি এর জন্য)

	পরিচিতি ঃ		
	জেলা ঃ	উপজেলার নাম ঃ	ইউনিয়ন ঃ
	গ্রাম ঃ		
	নাম ঃ		পেশা/পদবী

১।	১৯৭৫ সালে গঙ্গা নদীতে ফারাক্কা ব্যারেজ চালু করার প্রেক্ষিতে বাংলাদেশ অংশের গঙ্গা ও গড়াই নদীর পানি প্রবাহ অস্বাভাবিক ভাবে হ্রাস পায় এবং ইহার ফলে পরিবেশের উপর মারাত্মক বিরূপ প্রতিক্রিয়া দেখা দেয়। এ ব্যাপারে আপনি অবগত আছেন কি?	
২।	এই পরিস্থিতি মোকাবেলা করার জন্য পানি উন্নয়ন বোর্ড কর্তৃক ২০০৯ সালে গড়াই নদী পুনর্বাসন প্রকল্প, দ্বিতীয় পর্যায় নামে প্রকল্পের অধীনে গড়াই নদীর ড্রেজিং কাজ হাতে নেওয়া হয়। এ ব্যাপারে আপনি অবগত আছেন কি?	
৩।	এ প্রকল্প বাস্ত্মবায়নের কারণে বর্তমান শুষ্ক সময়ে গড়াই নদীতে সবসময় পানি থাকে কি?	
৪।	এ প্রকল্প বাস্ত্মবায়নের ফলে কৃষিজমিতে সেচ সুবিধা প্রদান করা হচ্ছে কি? এবং এতে কৃষি উৎপাদন বৃদ্ধি পাচ্ছে কি?	
৫।	গড়াই নদীতে বর্তমান শুষ্ক সময়ে নৌ চলাচল করতে পারে কি? এ নৌ চলাচল বৃদ্ধি পেয়েছে কি?	
৬।	এই সময়ে মাছ ধরা যায় কিনা, এবং তার উৎপাদন বৃদ্ধি পেয়েছে কি?	
৭।	শুষ্ক মৌসুমে গড়াই নদীর পানি নদীর পাড়ের বাসিন্দাদের ও গবাদিপশু গোসল করা সহ নিত্য প্রয়োজনীয় ব্যবহারে আসে কিনা।	
৮।	বর্তমানে এলাকার জনসাধারণের কর্ম সংস্থানের সুযোগ সৃষ্টি ও আর্থিক অবস্থার উন্নতি হচ্ছে কিনা? এর পিছনে এ প্রকল্পের অবদান আছে বলে আপনি মনে করেন কিনা?	
৯।	এলাকায় খাবার পানি হিসাবে কোন পানি ব্যবহার করা হয়?	
১০।	শুষ্ক মৌসুমে গড়াই নদী থেকে বালু উত্তোলন ও পরিবহণ করা হয়। বর্তমানে ব্যবসার অবস্থা কী?	
	সমন্বয়কারী কর্মকর্তার স্বাক্ষর ঃ তারিখঃ	

দলীয় আলোচনা (FGD) সমন্বয়কারীর নাম ঃ

স্বাক্ষর ঃ FGD অনুষ্ঠানের তারিখঃ

তদারক কারীর নাম ঃ

স্বাক্ষর ঃ তারিখঃ