temporary shed at the project site. Some labors of the contractor will stay in the night during construction period. As such, there may be outbreak of epidemic diseases at project site.

Mitigation:

During the epidemic diseases necessary measure will be taken up.

Temporary Latrines & Urinals:

Impact:

Temporary latrines and urinals will be provided at project site during construction period. Human wastes may be disposed of through temporary latrines & urinals.

Mitigation:

No mitigation measure is required.

Possible Accidents

There is possibility of occurring accident during construction stage since heavy earth moving equipment like dump truck, truck etc. may be deployed if contractor needs to carry earth from other area. In case of any accident, the nearby Upazila Hospital may be utilized. Safety measures arrangements is required at site

Mitigation:
No mitigation measure is required.

8.5.3 Public Opinion

In general, the local people's response to the project is positive. Most of the people who live in the project area have no objection towards the development of the project. Most of the people interviewed were not aware of any pollution hazard and also do not feel that the project would be the source of any hazard to them.

It may be mentioned here that the major expectations of the local people from the Project are increased crop production and creation of jobs for them. Some people will participate indirectly in various economic activities and support systems associated with the Project

A series of meetings held with the local people, Addl. Deputy Commissioner, Noakhali, District Livestock Officer, Noakhali and officials of the CDSP-III project.

It may be concluded that all of the stakeholders welcomed the proposed project for greater interest of the country. The farmers agreed to cooperate with the project authority and will participate in development activities.

8.6 Institutional Requirement and Environmental Monitoring Programme

An extensive monitoring program is not required. Timely operation of sluice gate will have to be done. The CDSP-III authority will arrange training to the farmer for O&M and timely regulator gate operations. The farmer will also be trained for IPM program.

However, the following parameters would be monitored as given in **Table 8.6.1.**

Table 8.6.1
Environmental Monitoring Parameters

Environmental Component	Parameter(s)	Sampling number/month
Erosion/siltation	Siltation at D/S of sluice to be removed	Under yearly maintenance programme
Natural Flushing	Timely gate operation of sluice	Occasional as required
Soil quality/salinity	Routine fertility analysis/Soil Salinity	Occasional during dry season.

8.7 Findings, Conclusions and Recommendations

Findings

The Project will not have any remarkable adverse impact on the environment. The project activity will increase the crop production of the area. The Project is implementable with the mitigation measures proposed in the **Table No. 8.5.2.**

Conclusions

After completion of the Project, production of crops will increase. The benefit from the crop production directly will go to the landowners. Others, especially the poor, will be benefited in terms of employment generation and easy availability of

agricultural products. Moreover, the project will contribute to the Governments "produce more food" program.

Recommendations

The project is for the development of newly accreted char lands for settlement of landless people for agricultural development in the tidal saline inundation prevented and drainage improved lands. Being FCD type, EIA is generally required. But IEE conducted gives no remarkable adverse impact on the environment and so the project is implementable.

It is recommended that the Project can be implemented.

Table 2.4 Costs of water management infrastructure in Char Nangulia

Sl. No.	Item of works	Quantity	Unit	Item Cost at 2009 year (Tk. '000)	Yearly O & M	
					%on 2009 cost	Estimated Cost (Tk. '000)
1.0	Drainage Sluices					
	1.1 DS-1 (9-Vent-1.5mx1.8m)	1	No.	104,816	2	2,096
	1.2 DS-2(5 Vent-1. 5m x 1.8m)	1	No.	59,895	2	1,198
2.0	Embankment					
	2.1 Sea Dyke	25.5	Km	237,170	4	9,487
	2.2 Interior Dyke	3.50	Km	25,976	4	1,039
3.0	Closures of khals	-	-			
	3.1 Major khals (Mamur/Caring)	3	LS	45,057	4	1,802
	3.2 Other khals	5	LS	7,498	4	300
4.0	Re-excavation of khal/ drainage channel (63.78 km)	915,066	Cum	46,291	2	926
4.1	Re-excavation of Caring khal	1,350,000	Cum	68,269	2	1,365
			Total:	594,972		18,213

Table 2.5 Costs of water management infrastructure in Noler Char

Sl. No.	Item of works	Quantity	Unit	Item Cost at 2009 year (Tk. '000)	Yearly O & M	
					%on 2009 cost	Estimated Cost (Tk. '000)
1.0	Drainage Sluices					
	1.1 DS-3(7-Vent-1.5mx 1.8m)	1	Each	89,177	2	1784
2.0	Embankment					
	2.1 Sea Dyke	6.0	Km	62,556	4	2502
	2.2 Interior Dyke	4.50	Km	41,156	4	1646
	2.3 Dwarf Embankment	13.25	km	9,347	4	374
3.0	Closures of khals	5	LS	7,720	4	309
4.0	Re-excavation of khal/ drainage channel (63.78 km)	52,819	Cum	2,671	2	53
			Total:	2,12,627		6,668

- The estimated amounts of water management infrastructures have been compared with the cost of ongoing CDSP-III related structures and found justified considering required cost escalation.

for TL, CDSP-III
12.03.09
SCE, CDSP-III

C/S
18/3/09
PD-CDSP-III
BWDB, Dhaka.

LGED and DPHE

Table 3.6 Cost estimate of internal infrastructure of Char Nangulia

Sl.No.	Item of works	Quantity	Unit	Item Cost at 2009 year (Tk. '000)	Yearly O & M	
					% on 2009 cost	Estimated Cost (Tk. '000)
1.0	Rural Roads (Type R-2)	37.77	Km	26,644	2	533
2.0	Bridge (20m Girder bridge	-	-	-	-	-
	2.1 20m span	3	No.	14,439	2	289
	2.2 15m span	3	No.	10,781	2	216
	2.3 10m span	2	No.	4,792	2	96
3.0	Box Cul vert, (1-Vent , 4m x 3m)	1	No.	1,331	2	27
	3.2 Pipe culvert (0.6m dia)	8	No.	1,065	2	21
4.0	Multipurpose Cyclone Shelter	17	No.	1,46,306	2	2,926
5.0	Community Pond	43	No.	17,170	2	343
6.0	DTW	607	No.	48,475	2	970
7.0	Latrine	9350	No.	24,890	2	498
8.0	Public Toilet	11	No.	8,799	2	176
9.0	Pond sand Filter Schemes	30	No.	7,185	2	146
10.0	Rain water Harvesting Schemes	60	No.	5,672	2	113
			Total:	3,17,549		6354

Table 3.7 Cost estimate of internal infrastructure of Noler Char

Sl.No.	Item of works	Quantity	Unit	Item Cost at 2009 year (Tk. '000)	Yearly O & M	
					% on 2009 cost	Estimated Cost (Tk. '000)
1.0	Rural Roads (Type R-2)	1745	Km	11,381	2	228
2.0	Bridge (20m Girder bridge	1	-	3,594	-	72
3.0	Culverts					
	3.1 Box Culvert (1-Vent 4x3m)	1	No.	1,331	2	27
	3.2 Pipe culvert (0.6m dia)	8	No.	1,065	2	21
4.0	Multipurpose Cyclone Shelter	10	No.	86,068	2	1721
5.0	Community Pond	24	No.	9,583	2	192
6.0	DTW	313	No.	24,997	2	500
7.0	Latrine	5159	No.	13,733	2	275
8.0	Public Toilet	12	No.	9,599	2	192
9.0	Pond sand Filter Schemes	16	No.	3,832	2	77
10.0	Rainwater harvesting schemes	32	No.	3,025	2	61
			Total:	1,68,210		3,166

for TL, CDSP-III
Chief Technical Advisor
12.03.09
PCE, CDSP-III

C/S 18/3/09
PD, CDSP-III
BWDB, Dhaka.

Recommendation of "Report Review Committee" on the Final Report of Feasibility Study on the Development and Settlement of new Chars; Char Nangulia, Noler char and Caring char, November 2008 for approval of the Board.

1. Background Information

1.1 Bangladesh Water Development Board (BWDB), by an Office order (Memo No-35/WDB (Sec)/Planning-1/Misc-3/2002 dated 03-07-2006; copy enclosed, Annex-A), formed a committee headed by the Chief Engineer, Design, BWDB, Dhaka to review and recommend about the Study Reports prepared by Consultants. The Terms of Reference (ToR) of the Committee may be seen in Annex-A.

1.2 Final Report was forwarded to the member-secretary of the committee by Chief Planning, BWDB, Dhaka vide U.O.no. 1025 dated 24 November 2008.

1.3 The report was prepared by Euroconsult Mott MacDonald, Dhaka.

1.4 Project Director, CDSP-III, BWDB, Dhaka under administrative control of ADG (Planning), BWDB, Dhaka represented the Board (the client) for conducting the study.

1.5 The Draft Final Report was discussed in a workshop on 14 January 2008, held at the BWDB conference room, Dhaka.

2. Activities of the Committee

2.1 The member-secretary received the Report on 26 November 2008.

2.2 (a) The member-secretary of the committee, being requested by the convener of the committee, communicated vide memo no. 1c-5/2006 (part-2)/366 dated 14 December 2008 the notice of meeting of the committee to discuss the report on 23 December 2008.

(b) Accordingly, the committee met on 23 December 2008 in the office room of the Chief Engineer, Design, BWDB, Dhaka & concerned Project Director, Executive Engineer from the field division were present in the meeting.

3. Observations of the Committee

3.1 The Committee observed that the comments, suggestions & recommendations made by the participants on the Draft Final Report of Feasibility Study on the Development and Settlement of new Chars; Char Nangulia, Noler char and Caring char, November 2008 in the meeting of 14 January 2008 have been properly addressed by the Consultants & concerned officials and incorporated in the final version of the Report.

3.2 The Committee discussed the report in the meeting (held on 23 December 2008) and the observation is presented in **Annex-B**.

4. Recommendations:

4.1 The Committee as per ToR opines that:

- প্রকল্পের মূল উদ্দেশ্যের সাথে সামঞ্জস্যতা ঃ The Final Report is consistent with the Objectives of the study (which is presented in the report).
- প্রদত্ত সুপারিশসমূহের বাস্তব ভিত্তি সম্বন্ধে ঃ The recommendations made in the study are realistic and implementable in the field.
- সমীক্ষা প্রতিবেদনের গুণগত মান প্রসঙ্গে ঃ The quality of the report is acceptable.

4.2 Under the above circumstances the Committee is recommending to accept the Final Report.

23/12/08

(Md. Fazlur Rahman)
Director, Planning-II
BWDB, Dhaka.
(Member-Secretary of the Committee).

26/12/08

(Md. Naushad Ali)
Chief Engineer, Design
BWDB, Dhaka.
(Convenor of the Committee).

বোর্ড সচিবালয়
ওয়াপদা ভবন (৩য় তলা)
মতিঝিল বাণিজ্যিক এলাকা,
ঢাকা-১০০০।

ফোন ঃ ১৩৩ (অফিস)

Annex - A

একই স্মারক নং ও তারিখে প্রতিস্থাপিত

স্মারক নং-৩৫/পাউবো (সচি)/পরি-১/বিবিধ-৩/২০০২ তারিখঃ ০৩-০৭-২০০৬ ইং

দপ্তরাদেশ

পরিকল্পনা-১ পরিদপ্তরসহ অন্যান্য সংস্থার নিয়োজিত বিভিন্ন পরামর্শক প্রতিষ্ঠান, ইনডিভিজুয়াল পরামর্শক, আই ডব্লিউ এম এবং সি ও জি আই এস কর্তৃক সম্পাদিত সমীক্ষা কাজ সমূহের চূড়ান্ত প্রতিবেদন অনুমোদনকল্পে পর্যালোচনার নিমিত্ত নিম্নবর্ণিত কর্মকর্তাদের সমন্বয়ে একটি কমিটি গঠন করা হইলঃ-

১। প্রধান প্রকৌশলী, নকশা, বাপাউবো, ঢাকা। ঃ আহ্বায়ক
২। পরিচালক, পরিকল্পনা-২ পরিদপ্তর, বাপাউবো, ঢাকা। ঃ সদস্য-সচিব
৩। প্রকল্প এলাকার সংশ্লিষ্ট নির্বাহী প্রকৌশলী, বাপাউবো। ঃ সদস্য

কমিটির কার্যপরিধিঃ

ক) সমীক্ষা প্রতিবেদনের [illegible] পর্যালোচনা এবং [illegible] সুপারিশ সমূহ বাস্তব সম্মত ও প্রকল্পের মূল উদ্দেশ্যের আলোকে সামঞ্জস্যপূর্ণ কিনা সে ব্যাপারে স্পষ্ট মতামত প্রদান।
খ) সমীক্ষার চূড়ান্ত প্রতিবেদন বোর্ডের পক্ষে যথাযথভাবে পর্যালোচনা ও নিরীক্ষা পূর্বক সর্বোচ্চ ৭(সাত) দিনের ভিতর বোর্ডের অনুমোদনের জন্য সুপারিশ প্রদান।
গ) বিবিধ।

বোর্ডের আদেশক্রমে
০৩.৭.০৬
(সোমসুননেহা)
সচিব, বাপাউবো
ঢাকা।

স্মারক নং-৩৫/১(৮)/পাউবো (সচি)/পরি-১/বিবিধ-৩/২০০২ তারিখঃ ০৩-০৭-২০০৬ ইং

অবগতি ও প্রয়োজনীয় ব্যবস্থা গ্রহনের জন্য অনুলিপি প্রেরণ করা হইল।

১) প্রধান পরিকল্পনা, বাপাউবো, ঢাকা।
২) প্রধান প্রকৌশলী, নকশা, বাপাউবো, ঢাকা।
৩) প্রধান প্রকৌশলী, বাপাউবো (সকল).....
৪) তত্ত্বাবধায়ক প্রকৌশলী, বাপাউবো (সকল).....
৫) পরিচালক, পরিকল্পনা-১, বাপাউবো, ঢাকা।
৬) পরিচালক, পরিকল্পনা-২, বাপাউবো, ঢাকা।
৭) সি এস ও মহাপরিচালক, বাপাউবো, ঢাকা।
৮) পি এ টু অতিরিক্ত মহাপরিচালক (পরিকল্পনা, পওয়া-১, পওয়া-২, বাপাউবো, ঢাকা।

৩/৭/০৬
(এ টি এম আবদুল বারী)
উপ-সচিব (পরিকল্পনা)
বাপাউবো, ঢাকা।

Annex-B

Feasibility Study on the Development and Settlement of new Chars; Char Nangulia, Noler char & Caring char: Final Report November 2008, done by Euroconsult Mott MacDonald, Dhaka

Compliance Report on the Objectives of the Study

Sl. No.	Objectives (as required in the ToR)	Compliance (as reported in the Report)
A.	**Comprehensive development plan for Nangulia Char & Noler Char**	
	1. Establishing baseline conditions	
	► Water management & Land suitability :	
	➢ Basic topographic map of present situation	Chapter-1, Fig-1.1, Page- 4
	➢ Basic drainage map of present situation	Chapter-2, Fig-2.1, Page- 8
	➢ Map of present salinity situation	Page-75
	➢ Flood map	Page-74
	➢ Identify bottlenecks & develop interventions	
	• Design of optimal internal drainage system to avoid bottlenecks	Chapter-2, Article-2.4.3, Page-14
	• Embankment heights	Chapter-2, Article- 2.4.2, Page-13
	➢ Drainage, salinity & flood maps with interventions	Chapter-3, Fig-3.1, Page-18
	➢ Land suitability map	Page-75
	►Population and settlements :	
	➢ Household Census	Chapter- 1, Article-1.4.2, Page-5
	➢ Occupation	Chapter- 1, Article- 1.4.3, Page-5
	➢ Migration Pattern	Chapter- 1, Article-1.4.5, Page-6
	➢ Income	Chapter- 1, Article- 1.4.6, Page-6

9-6

	➢ Food situation	Chapter- 1, Article- 1.4.6, Page-6
	➢ Land titles	Chapter- 4, Article-4.4, Page-27
	➢ Tenancy	Chapter- 4, Article-4.4, Page-27
	➢ Existing level of services	Chapter- 3, Article- 3.2, Page-17
	➢ Desired level of services	Chapter- 3, Article-3.3, Page-17
	▶Land allocation :	
	➢ GOB policy on land distribution & existing claims on land	Chapter- 4, Article- 4.3, Page-26
	▶Agriculture and livestock :	
	➢ Existing cropping pattern and yields	Chapter-5, Article- 5.3.2, Page-31
	➢ Existing livestock situation	Chapter- 5, Article-5.5.1, Page-34
	➢ Analyze agricultural practices	Chapter- 5, Article- 5.3.3, Page-32
	➢ Identify main bottlenecks	Chapter- 5, Article- 5.3.4-5.3.5, Page-32
	▶ Aquaculture and Fisheries :	
	➢ Map of existing actual activities with special focus on regional aquaculture	Chapter- 6, Figure-6.1, Page-39
	➢ Identify possibilities for small scale aquaculture	Chapter- 6, Article- 6.3.1, Page-40
	➢ Identify constraints for small scale aquaculture	Chapter- 6, Article-6.2.4, Page-40
	2. Identification of possible interventions	Chapter-3, Article- 3.3, Page-17
	3. Analysis of costs & impacts of interventions	
	➢ Costs and benefits of proposed interventions	Chapter-3, Article- 3.4, Page-21
	➢ Costs and benefits of proposed land settlement	Chapter-4, Article- 4.5, Page-28
	➢ Costs and benefits of agriculture and livestock development	Chapter-5, Article- 5.7, Page-37
	➢ Costs and benefits of aquaculture and fisheries development	Chapter-6, Article- 6.4, Page-43
	➢ Costs and benefits of forestry development	Chapter-7, Article- 7.5, Page-48
	➢ Costs and benefits of institutional development	Chapter-8, Article- 8.5, Page-55
	➢ Social impacts	Chapter-9 , Article-9.3, Page-59
	➢ Environmental impacts	Chapter-9 , Article-9.4, Page-60

L-6

	4. Formulating the development plan, setting priorities & timetables & making an overall assessment of the impacts (feasibility study)	
	➢ Land distribution plan	Chapter- 4, Article- 4.4, Page-27
	➢ Development plan for infrastructures	Chapter-3, Article- 3.3.2, Page-21
	➢ Development plan for agriculture and livestock	Chapter-5, Article- 5.4.1 & 5.6, Page-33 & 36
	➢ Development plan for aquaculture & fisheries	Chapter-6, Article-6.3, Page-40
	➢ Plan for social forestry on roads, embankments etc.	Chapter-7, Article-7.4.1, Page- 47
	➢ Development plans and management system for shore and social mangrove forestry for applying public participation and process	Chapter-7, Article-7.4.1 & 7..4.2, Page-47 & 48
	➢ Support the delineation of administrative bodies and their involvement in the implementation of the development plan	Chapter- 8, Article- 8.2.2; Page-51
	➢ Plan for involvement of NGO's/LGI's	Chapter- 8, Article- 8.3, Page-53 & Page-76
	➢ Outline of sustainable structure of local committees for land and water management	Chapter- 8, Article- 8.4, Page-53 & Page-76
	➢ Overall costs and impacts	Chapter-9, Article- 9.1, Page-56
	➢ Priorities and timetables	Page-78
B.	**Preliminary development plan for Caring Char**	
	1.Topography & Water management :	
	➢ Basic topographic map of present situation	Chapter-1, Fig-1.1, Page- 4 ,
	➢ Basic drainage map of present situation	Chapter-2, Fig-2.1, Page- 8
	➢ Map of present salinity situation	Page-75
	➢ Flood map	Page-74. Data are shown in article 5.2.1 (page-29)
	➢ Assessment of accretion rate	Page-79
	2. Further reconnaissance on living conditions	Chapter-5, Article- 5.3.3, Page-32 Chapter-6, Article- 6.2.3, Page-40 Chapter-7, Article- 7.2, Page-46

8-6

	3. Forestry : ➢ Development of plan for establishment and management of a forestry	Chapter- 7, Article- 7.5.1, Page-49
	4. Interventions : ➢ Identify and plan for immediate interventions	Chapter-3, Article- 3.3.2, Table-3.5, Page-21
	5. Environmental impacts	Chapter-9, Article-9.4, Page-60
	6. Social impacts	Chapter-9, Article-9.3, Page-59
C.	External drainage situation : ➢ Identify all possible interventions ➢ Make a screening and selection of most promising ones ➢ Further analyze the selected promising solutions ➢ Make a comparison between these promising solutions in support of decision making by the BWDB	Chapter-2, Article-2.3.2, Page-11 & Page-80 Chapter-2, Article-2.3.3, Page-11 & Page-80 Chapter-2, Article-2.3.3, Page-11 & Page-80 Chapter-2, Article-2.3.3, Page-11 & Page-80

6-6

23/12/08

G M Shamsur Rahman
Project Director
CDSP-III
BWDB, Dhaka

23/12/08
প্রকৌশলী
ডেভাইন, বাপাউবো,
ঢাকা।

23/12/08
(মুহঃ ফজলুর রহমান)
পরিচালক
পরিকল্পনা পরিদপ্তর-২
বাংলাদেশ পানি উন্নয়ন বোর্ড, ঢাকা।

Sediment Management Plan for Hoar Khal and Caring Khal

Sedimentation is likely to occur at the outfall of the Haor Khal and Caring khal during the period from late September to June. The following measures will be followed after implementation of the project.

(i) Initially the depth of sedimentation would not be significant, which can be in the range of 30 to 50 cm. An operation rule for operation of the gate will be followed to generate eroding velocity at the downstream stretch of the Hoar Khal and Caring Khal. In the beginning of October only two gates/one gate of each regulator will remain open instead of all the gates of the regulators to obtain sufficient head difference of water between upstream and downstream. Eventually the stream power will be higher to transport the incoming sediment load further downstream from the outfall of the Khals. Even, if any sedimentation occurs that would be very less. This mechanism of sediment management would be effective from October to November. However, it will reduce the depth of sediment deposition.

(ii) A monitoring system would be followed to find the sedimentation rate and its exact location by cross section survey with 500m spacing in the Haor Khal and Caring Khal. A lead channel having the capacity of 2m X 1.5m would be developed at the silted reach based on monitoring results before the onset of monsoon. At the onset of monsoon the remaining loose/unconsolidated sediment deposition will be removed and required drainage condition would be developed due to huge onrush of fresh water.

01-3-09

Team Leader - Acting
Char Development & Settlement Project
Dhaka.