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People's Republic of Bangladesh
Ministry of Irrigation, Water Development
and Flood Control

Flood Plan Coordination Organisation



JAMALPUR PRIORITY PROJECT STUDY

Caisse Francaise de Developpement
and
Commission of the European Communities

FAP 3.1

B.N.-97
A-118(3)

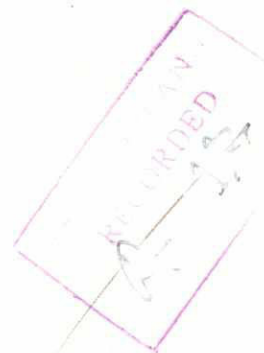
FINAL FEASIBILITY REPORT

ADDENDUM

January 1993



A-5



Consortium

SOGREAH/ HALCROW/ LAHMEYER

in association with
Engineering & Planning Consultants Ltd.
AQUA Consultants and Associates Ltd.
and Service Civil International.

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PEOPLE'S REPUBLIC OF BANGLADESH
MINISTRY OF IRRIGATION, WATER DEVELOPMENT AND FLOOD CONTROL
FLOOD PLAN COORDINATION ORGANISATION

JAMALPUR PRIORITY PROJECT STUDY

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ADDENDUM

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Appendix - A

1. **INTRODUCTION**

Following submission of the Jamalpur Priority Project Study Final Feasibility Report (January 1993) a meeting was held at FPCO on February 1993 in which various comments were made on the Report. A list of these comments is presented in Appendix A. The meeting concluded that the Consultants would revise the Executive Summary to take full account of these comments and would also prepare an addendum to the Report. It was agreed however that no changes would be the Main Report and Annexes.

The purpose of this Addendum is therefore to provide further clarification in response to the comments raised and, as necessary, to include errata for any typographical or compilation errors that had come to light.

2. RESPONSES TO COMMENTS RAISED

2.1 Flood Proofing

The report indicates that consideration may be given to relocating some of the proposed pilot areas for flood proofing from the Jamuna to the Old Brahmaputra river. The report notes however that since the latter area has not been within the consultant's study area, no baseline data has been collected there. This would need to be undertaken if such a relocation was to occur. Nevertheless the Consultants' recognise the importance of parallel measures in the Old Brahmaputra.

Accordingly Figure E3 has been ammended in the Executive Summary (reproduced in black and white herein) to show the possible alternative locations. Figures 7.5 of the Main Report and 7.2.3 of Annex 7, Engineering, should be ammended similarly.

2.2 Compartmentalisation

Under the FAP 3.1 project, measures for compartmentalisation include the following components:

- improved drainage to increase agricultural production with due consideration of fishing activities in beel areas.
- water control in river beds through check structures to increase fish production
- improved cross drainage at compartment boundaries which are often delineated by existing roads without adequate culverts.

The cost of the cross drainage improvement component has been estimated at Tk 10 million out of a total of Taka 41.2 million for all of the above measures.

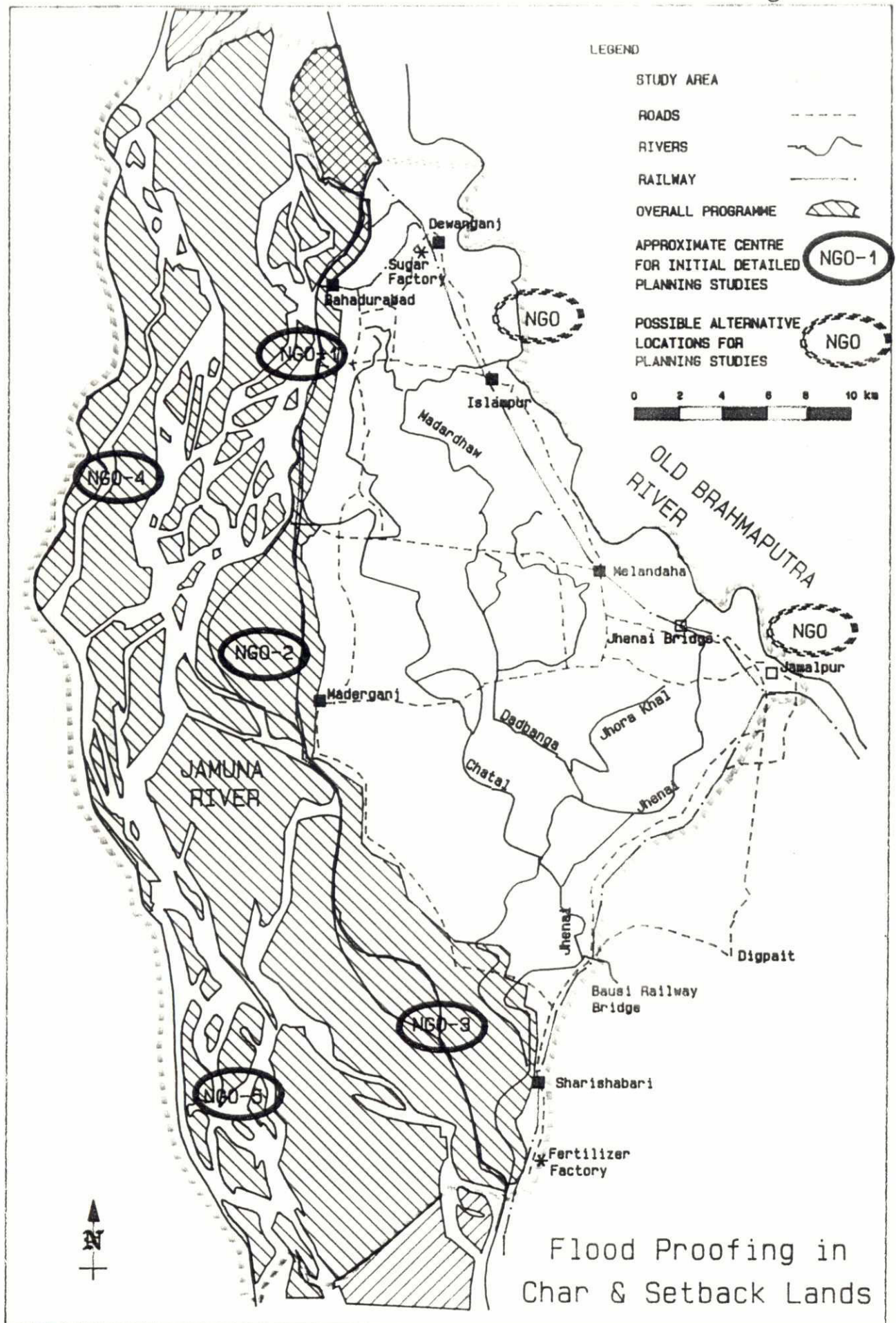
The question has been raised as to how these measures and costs compare with compartmentalisation works on the other side of the Jamuna in the FAP 2.1 area. For an area of 57,000 ha, FAP 2.1 have apparently allowed:

Roads embankments	Taka 11.0 million
Pipes and Sluices	28.0 million

Total	39.0 million

which are equivalent to Taka 193/ha and Taka 491/ha respectively. The improvement of cross drainage for FAP 3.1 has been identified as being relevant for areas covering some 32,000 ha, equivalent to a cost of Taka 312/ha. No special provision has been made for rehabilitation of

Figure E3



the embankments per se. In addition, however, FAP 3.1 proposes a further Taka 31.2 million spent specially on local drainage works. Thus it may be seen that whilst differences exist in the manner in which investments are allocated, overall the amounts are similar. It may be noted also that in any event detailed design for compartment boundaries as well as the assessment of direct benefits will have to take account of the final recommendations awaited from FAP 20.

2.3 Fisheries

2.3.1 Strengthening of measures

As a result of the discussions on the Final Feasibility Report, the Consultant was requested to consider the strengthening of the measures included in the proposed Fisheries Mitigation Programme.

Regarding the NGO component, additional administrative staff and additional field workers for beel, borrow pit and inland river development would be required.

Regarding the Technical Assistance component, a one year Fishery Baseline Resources Survey (FBRS) would be required.

The corresponding costs are as follows:

Designation	Unit cost '000 Tk	Quantity	Total in 'million Tk.
<u>NGO Component</u>			
Administrative Staff	3	840 m/months	2.20
Field workers	3	1680 m/months	5.04
Running Costs	-	LS	0.76
Sub-total			8.00
<u>FBRS</u>			
Foreign Consultancy	-	LS	2.24
Survey leader	10	12 m/months	0.12
Statisticians	10	12 m/months	0.12
Field Supervisors	5	40 m/months	0.20
Field Workers	3	160 m/months	0.48
Running Costs	-	LS	1.34
Sub-total			4.50
Total			12.50

Furthermore, a credit line of Tk 15.0 million to cover loans for the development of pond, beel and borrow pit fisheries is recommended. Corresponding adjustments have been made to the total costs for the Fisheries Programme shown in the revised Executive Summary.

2.3.2 Other Issues

- (i) Page 2.26 and 27, Annex 2
The general trend of overfishing cannot be questioned. In the absence of reliable data in Jamalpur area, and for planning purpose, the adoption of the 1.5% yearly decreasing trend for fish catches was considered as reasonable.
- (ii) Fish sensitive gated structure
Recommendations of FAP 17 are to be taken into account at detailed design stage.
- (iii) Page 2 - 43, Annex 2
Cost for the supporting programmes has been increased as detailed above.
- (iv) Page 2 - 42, Annex 2
285 ha of nursery area derives from the calculation of fingerlings demand as per para 5.3.5 and table 2.5.5. The cost of the support of the nursery programme is included in the cost for the NGO component.

2.4 Environmental Management Plan

An outline of the proposed Environmental Management Plan (EMP) is presented in the revised Executive Summary. This highlights specific measures needed, including further surveys, studies and monitoring programmes necessary to fully define the plan.

2.5 Economics

2.5.1 Additional Simulations

Following requests to do so the following additional simulations have been tested in relation to the original base case:

- (i) Variation of Exceptional Flood Damage

	EIRR	NPV (million Taka)
Damage Estimate - 25%	12.63%	41.0
Damage Estimate + 25%	15.36%	230.2

(ii) Variation of Assumptions of Fish Production

In the comments received on the Fisheries Programme it is suggested that not only should additional amounts be provisioned for NGO support, credit and a baseline survey, but also that the assumptions regarding fish pond production should be varied. It is suggested that in the without-project situation fish pond production would grow to only half the previously predicted level and that in the with project situation, the forecast yield increases would be achieved within the period of the NGO support programme, increases thereafter being in proportion to without project growth trends.

	EIRR	NPV (million Taka)
With revised fisheries assumptions	14.76%	186.0

2.5.2 Clarifications of Model Output Data

Designations in tables of Appendix C of Annex 8 are as follows:

- (i) Tables 8.C.1 WO, A1 and B. Rice area - Damaged rice area.
AN. AGRI. DAMAGES: means the total annual losses on account of reduced paddy yields due to normal flood events.

- (ii) Tables 8.C.8.1 WO, A1 and B 8.C.8.2 WO, A1 and B, 8.C.2.1 AO and 8.C.22 AO

AN.AGRI.DAMAGES:ditto above - Taken into account for the calculation of agricultural gross value with yields for "damaged area".

- (iii) Tables 8C1AO, 8C5A1 and B.

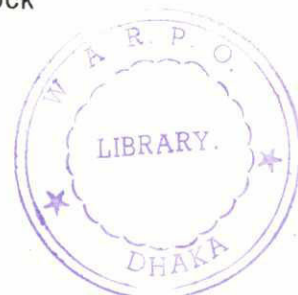
INF INVESTMENTS L.C.:means infrastructure investment in local currency

INF INVESTMENT F.E.:ditto above, for foreign currency

- (iv) Tables 8.C.8.1 WO, A1 and B, 8.C.8.2 WO, A1 and B, 8.C.2.1 AO and 8.C.2.2 AO

AGIC. GROSS VALUE:includes value added for livestock

VALUE ADDED AGRI:includes value added for livestock



2.6 Growth in Agricultural Production

The basis for evaluation of agricultural benefits for the mainland project is the estimate of the incremental production made possible by the project. To facilitate this calculation only those changes referred to in the Report in the reference situation are evaluated. The Report specifically does not include any allowances for global yield increases made possible to external changes such as new or further improved rice varieties being available. Thus the future rice production levels are based on levels attained now and do not make allowance for any underlying yield improvement trends.

3. ERRATA

- (i) Main Report
If not done so already Table 2.4.2 of the Main Report should be replaced by Table 2.4.2 hereafter
- (ii) Annex 2, p2.24, para 3.7.1, second line Replace "Project Area" by "District Area".
- (iii) Annex 7, p7-16, para 2.4.2, 4th bull-point
Where reference is made to inlet structures being "definitely closed" in the late monsoon, this should be read as "most probably closed". It is acknowledged that in certain circumstances in dry years additional inflows could be required at this time.
- (iv) Annex 8, Tables 8.2.4, 8.2.5 and 8.2.7
Units for Gross Value should read " '000 Taka", not "million Taka".
- (v) Implementation Programme
The Implementation Programme given in the Main Report Figure 7.7, in Annex 7 as Figure 7.7.1 and in Annex 8 as Figure 8.4.2 should be read as given overleaf. The main change is a slight delay in construction of the Jhenai/Chatal outlet to enable maximum time to study its sizing in relation to assumptions regarding outflows at Bausi Bridge.

Table 2.4.2 Reference Situation (WO) - Areas and Production

Crops	Present situation				Future situation			
	Areas (ha)	Yield (t/ha)	Produc- tion (t)	Gross value MTK	Areas (ha)	Yield (t/ha)	Produc- tion (t)	Gross value MTK
L. Boro	3196	2.50	7990	50282	3196	2.50	7990	50282
HYV Boro	25861	4.27	110430	658627	27322	4.27	116595	695396
B. Aus	12324	1.20	14790	97401	12324	1.20	14790	97401
HYV Aus	2175	3.00	6525	38935	2175	3.00	6525	38935
L.T. Aman	13244	2.11	27931	181328	13244	2.11	27931	181328
HYV Aman	19866	3.59	71414	444538	19866	3.59	71414	444538
B. Aman	1461	1.41	2055	13341	0		0	0
DWT. Aman	5896	1.41	8291	60677	5896	1.41	8291	60677
Mix. Aus+Aman	7917	1.64	12989	84391	7917	1.64	12989	84391
Boro	29057	4.08	118420	708908	30518	4.08	124585	745677
Aman	44426	2.62	116186	742079	42965	2.66	114131	728738
Aus	18458	1.51	27810	178531	18458	1.51	27810	178531
Total paddy	91940	2.85	262415	1629519	91940	2.90	266525	1652947
Wheat	6951	2.00	13902	122407	6951	2.00	13902	122407
Jute	10645	1.70	18096	213922	10645	1.70	18096	213922
Sugar cane	2155	45.00	96975	87568	2155	45.00	96975	87568
Potato	1579	8.00	12632	50339	1579	8.00	12632	50339
Mustard	3511	0.80	2809	33287	3511	0.80	2809	33287
Pulses	8892	0.85	7558	98103	8892	0.85	7558	98103
Vegetables	8311		20196	149495	8311		20196	149495
Millet	2002	0.80	1602	11150	2002	0.80	1602	11150
Groundnut	1712	1.30	2226	19366	1712	1.30	2226	19366
Sweet potato	1801	6.50	11706	30553	1801	6.50	11706	30553
Sub-t.other crops	47559			816189	47559			816185
TOTAL	139499			2445708	139499			2469132
Irrigated area	31131	42%			32592	44%		
Fallow/grassland	2135	3%			2135	3%		
Single cropping	12327	17%			12327	17%		
Double cropping	51393	69%			51393	69%		
Triple cropping	8129	11%			8129	11%		
Cropping intensity	191				191			

Source: Consultant's calculation; results of simulation.
Notes: Future situation is given for a full operational year.
Gross value is calculated with economic prices.

Figure E.6

JAMALPUR PRIORITY PROJECT IMPLEMENTATION PROGRAMME

ACTIVITY	1993	1994	1995	1996	1997	1998	1999	2000
Engineering & T.A.								
Contracts Tender & Award	---	---	---	---				

MAINLAND PROJECT	1993	1994	1995	1996	1997	1998	1999	2000
PHASE 1								
Drainage Pilot Project								
Jamuna Embk. Bahadur.-Chatal								
Jamuna Embk. Chatal-Madarganj								
Jamuna Embk. Madarganj-Sheria								
Protection Embk. Dewanganj								
Protection Embk. Islampur								
Protection Embk. Jamalpur								
Chatal Inlet Structure								
Jhenai/Chatal Outlet Structure								
Flushing Structures								
Drainage Improvement Project								
Fisheries Project								
PHASE 2								
Old Brahm. Embk. South Half								
Old Brahm. Embk. North Half								
Sheria.-Fertil. Factory Embk.								
Islampur Inlet Structure								
Jhenai Inlet Structure								
Flushing Structures								
% INVESTMENT PER YEAR (a)	7	15	20	21	20	8	5	4

CHAR AND SETBACK LAND PROJECT	1993	1994	1995	1996	1997	1998	1999	2000
Pilot Project								
Main Development								

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Appendix - A

Main Points and Actions arising from the meeting of
10 February 1993 at FPCO

Jamalpur Priority Project Study

Main Points and Actions arising
from the meeting of
10 February 1993 at FPCO

Comments Received	Actions to be taken
<p>1 Flood Proofing – Provision required for a pilot programme of flood proofing measures in the Old Brahmaputra.</p> <p>– Assurance required that only incremental costs of flood proofing programme have been taken into account in evaluation of the mainland project</p> <p>2 Unit Rates The unit rates applied by the Consultant for implementation under ICB conditions may be too low and further sensitivity tests may be required to test alternative values. The Consultants do not have to ammend the Report but are requested to assist with further analyses to confirm project viability.</p> <p>3 Embankment Alignment Consultants are requested to explain why the Jamuna embankment follows the alignment shown between Madarganj and Sharishabari, and not one nearer to the Jamuna left bank line given the extent of attached char in this area. The further west the line the greater the protected area.</p> <p>4 Compartmentalisation Consultants are requested to explain whether the structural measures for compartmentalisation have been allowed for and whether the benefits taken in the protected area are valid with the measures so far included.</p>	<p>1 Flood Proofing – <i>Report refers to possible allocation of part of Jamuna pilot programme to Old Brahmaputra. Consultants will amend Figure E3 to add clarification.</i></p> <p>– <i>Assurance given. The costs of the pilot programme are financial provisions only. The economic cost of mitigation is based on the incremental cost on the total investment in flood proofing in the Char and Set-back land.</i></p> <p>2 Unit Rates <i>The Consultants will assist with further analyses during the period of the Appraisal Mission in Dhaka</i></p> <p>3 Embankment Alignment <i>Embankments were aligned to give maximum use of existing embankment alignments to minimise land acquisition, whilst endeavouring to maximise the protected area. The alignment between Madarganj and Sharishabari follows such embankments as do exist in this area and avoids land further to the west which is relatively newly accreted and is expected to present foundation problems.</i></p> <p>4 Compartmentalisation <i>Consultants will review FAP 2.1 estimates in the light of their own, and if significant differences arise will undertake a sensitivity test on the effect of the increased costs. The outcome will be noted in an Addendum to the Report.</i></p>

Comments Received	Actions to be taken
<p>5 Structure Design Refinement of structure designs is required to see if further savings are possible</p>	<p>5 Structure Design <i>This will be done during detailed design.</i></p>
<p>6 Fisheries Mitigation Programme Provisions for programme support may not be adequate to achieve the forecasted productivity increases.</p>	<p>6 Fisheries Mitigation Programme <i>The impact of additional costs and possible benefits arising from a less optimistic without-project growth in pond production are not expected to affect project viability significantly, and in any event to be within the range of the sensitivity tests already undertaken. The need for further base-line data collection also requires stating clearly. These points to be addressed in the Addendum to the Report.</i></p>
<p>7 Environmental Management Plan The Report does not contain an Environmental Management Plan. This should be addressed.</p>	<p>7 Environmental Management Plan <i>An additional section will be included in the Executive Summary, drawing on the various components already included within various sections of the Report and Annexes. An outline EMP will be given identifying the main problems, measures required (quantified to the extent currently possible) and any likely residual effects (again, to the extent quantifiable at present). Indications will be given of what is expected to be accomplished during the implementation phase and what may require to be done thereafter.</i></p>
<p>8 Economics Further sensitivity tests are required to assess possible variation in overall magnitude of damage reduction.</p>	<p>8 Economics <i>Additional tests will be carried out and results given in the Report Addendum.</i></p>

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Comments Received	Actions to be taken
<p>9 Social Impacts</p> <ul style="list-style-type: none"> - Clarification needed of whether costs of mitigating social impacts have been included in the economic assessment. - Quantitative identification is necessary of fishery households which are expected to disbenefit from the interventions is required and the level of nutritional impacts upon these groups. - The problems of resettlement (as well as land acquisition) should be fully addressed. 	<p>9 Social Impacts</p> <ul style="list-style-type: none"> - <i>Economic costs of fisheries programme and the incremental costs of flood proofing measures outside the embankment have been included in the base case analyses. A programme targetted at non-direct project beneficiaries has also been identified in the Report but this is excluded from the economic analyses.</i> - <i>This is not possible with any reliability at this stage - to be tackled during detailed design.</i> - <i>To be reviewed during detailed design.</i>
<p>10 Growth in Agricultural Production</p> <p>Clarification needed of the assumptions made with regard to long-term growth of agricultural production in the reference situation (W0) to distinguish the difference between those adopted for project evaluation purposes and those which may otherwise be expected to occur.</p>	<p>10 Growth in Agricultural Production</p> <p><i>This will be mentioned in the revised Executive Summary.</i></p>
<p>11 Inlet Structures</p> <p>Refinement of designs and detailing of operational procedures are needed.</p>	<p>11 Inlet Structures</p> <p><i>Refinement to be undertaken during detailed design. Reference to inlet gates being "definitely closed" to be corrected in an erratum in the Report Addendum.</i></p>
<p>12 Executive Summary</p> <p>Various points of clarification are needed in the Executive Summary, including minor corrections etc.</p>	<p>12 Executive Summary</p> <p><i>A revised Executive Summary to be presented.</i></p>



