All peripheral structures of the Naogaon polder are planned to be connected with the existing network system with addition excavation and re-excavation. May be in the sequence of work the structures have been initially constructed. But this does not mean that the drainage network is ignored. The consultant should have proper idea before commenting on anything. They should go through the detail project planning of the Naogaon polder. Once again side drains as stated by the consultants is not always possible. The para may be rewritten.

The comment is prepared based on misunderstanding of the paragraph. The paragraph never addresses the Naogoan Polder Project in the sense of lack of drainage network. On the contrary the paragraph says "construction of drainage culverts with flap gate in the case of Naogoan Polder is also one way for drainage improvement, instead of construction of side drain network and drainage sluices".

The intention of the paragraph is that when field reconnaissance was made, many culverts with flap gates were seen with rather not far distance. Accordingly there seemed that there might have had possibility to reduce the number of culverts by construction of side drain. Of course it is true that side drain is not always possible as also mentioned in the above response of 6.135.

6.137 Page 2-13, lst para

It is stated that no overland flow from outside of this project area was considered in designing a drainage sluice.

It is not clear where from the consultant got the idea. However, the major sluices of the Naogaon polder considered this type of overland flow. However, additional discharge from any possible breach has not been considered. This is a burning issue as to how much is the additional discharge out of one or more breaches and how this affect the cost of a drainage sluice. A breach in the Naogaon embankment near Eleng in 1987 damaged most of the structures within a radius of 8 km of this breach and formed a new channel in the down-stream of this breach.

However, the paragraph may be re-rewritten in the light of discussion above so that the facts are not distorted.

Again this paragraph never addresses the Naogoan Polder. The case was found in other projects. This kind of idea came up as the result of our own drainage analysis conducted in FAP-2.

6.138 Page 3-2, last but one para

It is said that drainage pumping is not economically feasible. What about drainage cum-irrigation pumping? Whether this consultant evaluated that? This concept has been practiced in Pabna Project in North West Region and in Meghna-Dhonagoda Project in South East Region.

Our study considers only drainage, however the irrigation cum-drainage pumping obviously brings more benefit.

6.139 The proposals with regard to river bank protection, as presented on p,3-6, Volume 3, are rather primitive and can not be considered as representative for the rivers in Bangladesh, certainly not for a river like the Teesta. The consultants should study this subject more in depth, in order to add more credibility to their proposals and the related cost estimates.

See response to comment 4.3.

6.140 Page 3-5 (b)

Overflow section in dwarf embankment without protection may cause serious erosion. Some protective measures may be considered.

The consultant may also explain if there would be any adverse effect of this type of structures upon road communication and how this would be mitigated.

During the study period, we inspected existing submergible embankments in the NE region, which are said to keep proper functioning. As far as we overlooked these at that time, the overflow sections are not provided with any protective measures. Although the dwarf embankments were preliminarily designed, at this stage with reference to the existing flood control structures, we agree that provision of some protective measures (brick matressing or concrete/asphalt facing) should be examined in next F/S stage based on the extent of deterioration in overflow section of existing submergible embankments.

The dwarf embankments are planned to be provided in low-lying area where navigation is generally more important rather than road communication during the monsoon period. In addition, the dwarf embankments are located near the cuts where at present people are using lesser parts of the embankments as road and navigation. It is considered that one of the promissing ways for retaining the road communication, if necessary, is to build new relocation road to connect both ends of the dwarf embankment using existing rural roads (It will be very costly to construct bridge over the dwarf embankment for use of road communication). The relocation road would require some drainage facilities such as drain pipes, culverts and sluices to secure the required flow area. However, this should be examined in next F/S stage based on the detailed/newest topographic maps in compliance with its necessity to be clarified.

6.141 Page 3-6, River Bank Protection Works

The consultants have proposed only the direct measures. FAP 21/22 are considering some indirect or preventing measures. These should also have been discussed.

We were waiting for the results of FAP 21/22, but their studies were not completed at the time of preparing the Draft Final Reports. Surely we will consider the FAP 21/22's measures in next F/S or D/D stage of each project selected for development after the direct measure as well as effective indirect or preventing measures are to be finalized through their studies to be utilized for the FAP priority projects.

6.142 Page 4-2, last para

It is said that the project (North Rajshahi Irrigation Project) would not have high priority -- since it is primarily an irrigation project.

It is not understood why the irrigation is a disqualifying criteria to get a priority.

This is a flood control and drainage plan. Other types of projects have not been strictly prioritised.

Catagory 3

Category 3 comments are noted, unless otherwise stated.

6.143 Page 2-6, lst para

The sentence "Afterwards -- the Punarbhaba and the Kakra" may be corrected in consideration of their actual locations.

6.144 Page 2-6 last para, 2nd line

The Karatoya river in Dinajpur is not a part of the Korotoya-Bangali river. The upper reach of Atrai is called the Karatoya (Ref. Fig. 5.3).

6.145 Page 2-10, 2nd para

The expression "The area suffers -- water in the Teesta" is confusing. This may be rewritten.

6.146 Page 2-12, 24th para, 6th line

'bears ground' should be 'bare ground'?

6.147 Page 5-6, sl (2)

Figure 5.2 does not show the conveyance capacity of Tangon. This may be corrected.

Figure 5.2 should be corrected to Figure 5.3.

VOLUME 4 : INITIAL ENVIRONMENTAL EVALUATION:

Category 1 : Comments

6.148 The report is far too long, Chapters 2-4 unnecessarily repeat information already given in the main volume: A summary of salient points would have sufficed, adding only information that is not covered in the main volume. There is also much repetition of material between chapters, especially chapters 4 & 5.

Because the authors trespass into subject areas beyond their own expertise, they make a number of 'lay' errors: e.g., on page 2-4, para 4, 'the main oilseed brassicas are sesamum and safflower tishi', neither of which crops are brasiccas (and safflower is **kusum phul**). The report should have been vetted by engineers, hydrologists and other specialists on the team to eliminate such unnecessary errors before being presented to FPCO.

The report also shows lack of proof reading. There are too many typographical errors and nonsense sentences.

There are many statements of the kind 'while the environment has shown considerable resilience to stress and change, critical thresholds are being reached' (page 2-15, para 4), without giving any evidence to support such assertions. Accordingly, such statements appear subjective, not scientifically based. They should be avoided, or supported.

6.149 Statements and inferences about HYV crops, chemical fertilizer and pesticides appear technophobic. While it certainly is in order to advocate caution in the use of agrochemicals, the authors appear not to appreciate that it is impracticable for Bangladesh to produce the level of rice yields needed to support the existing population, let alone projected future populations, without growing HYVs and without supplementing natural soil fertility with the use of appropriate fertilizer.

Local paddy varieties, however well adapted they might be to local micro environments, do not have the capacity, even with fertilizer use, to produce the yields and production needed by present or future population numbers. Similarly, it is quite infeasible to supplement soil fertility to the extent required for higher crop yields through the use of organic manures, even if the required biomass were available for the purpose. And even if organic manures would be available for use in the required amounts, the nitrogen they contain could contaminate surface and ground waters in just the same way as can excessive use of nitrogen fertilizers, not to speak of the disease hazards it might also entail.

Certainly, organic manures should be used to the extent that they are available, and certainly, chemical fertilizers should be used judiciously (if only for economic reasons). Certainly, too, environmental monitoring should be carried out so as to provide early warning of any possible contamination. But to condemn the use of HYVs and agrochemicals out-of-hand, as appears to be advocated, is to condemn the population to starvation, especially the marginal

households whose interest the authors so frequently plead priority support for. The authors should amend their statements to give a more realistic, balanced appraisal of the soil and water environments.

Technophobia is also apparent in the authors' seeming preference to foresee the worst outcome, often merely speculative, of any intervention in the natural environment: e.g., page 2-22, para 4, page 3-13, paras 1 and 2; and several other speculations about disease incidence. While it is certainly in order to point out possible adverse impacts, the authors give the impression that they have sought any stick to beat development interventions with. A more balanced, objective presentation is needed.

Certainly, the future for the people of the NWR and Bangladesh, as for many people in both developed and less developed countries, is fraught with difficulties. But it is no help to such people to advocate a return to a supposedly rosy past when technological interventions were not required to support human livelihoods and welfare. Technological interventions may raise problems - and certainly, there is evidence in the region that some interventions have raised problems - but the solution, surely, is not to turn away from such interventions in despair but to design and manage them better so that they provide the intended benefits. To advocate otherwise is equivalent to the attitude of those who insisted that red flags be carried in front of cars or trains in the early, frightened days of powered vehicles. This unbalance needs to be corrected. The report should be vetted by authorities in relevant specialist fields.

These comments are made by the foreign agriculturalist on the Panel of Experts, not the environmentalist.

Category 2 : Comments

These comments are noted, unless otherwise indicated.

It appears that Land and Water resources (principal physical resources) and Biological resources received less attention compared to quality of life value (and not human environment).

6.150 P-2-11-2nd paragraph

Why 1991 figure shows a decline in DSSTW is not clear (Domestic water supply is increasing dependent on it). 5th paragraph - surface & water resources could have been discussed a little further.

6.151 P 2-12, Section 2.6.1.

Land use and crop diversity very well written pieces of work. Quantification would have made the information much more valuable.

6.152 P-2-14

Market price of doncha and chan have been mentioned without any quantification.

6.153 Fig. 2.6 and 2.7

Source should have been mentioned which would have enhanced the credibility of the figures.

That areas are set aside for growing thatching grass chan is an encouraging information (P2-14). "Areas of grassland have also virtually disappeared" (P-2-15). Is this grass referred to grazing?

6.154 4th para last line (P-2-15)

Is conservation enough for future need ? How about augmentation and possible ways to do this.

6.155 P-2-15

Management of the homestead environment, economic and ecology is so well integrated that aesthetic value of land scaping is absent (1st line 2nd para some) seem queer.

6.156 P-2-16 last lines

If the consultants are taking about public management the statement may be true. In spite of repeated unwise interference without adequate under standing of micro-level in management, people back there have the enormous resilience and survived catastrophic onslaught but managed their affairs well.

6.157 P-2-17

Last but one paragraph - By all means efforts must be taken to preserve germ plasm bank.

6.158 Last paragraph

Under Bangladesh context will it not be quite difficult to preserve diversity in site. Probably at least in the foreseeable future it is the institutional arrangement that will guarantee the resources conservation.

6.159 P 2-18 1st para

A very fundamental issue has been raised. Under the World Bank prescription of open market economy and an extremely weak economic infrastructure such a pious hope will work out. As long as structure such a pions hope will not work out. As long as Bangladesh itself cannot dictate its priorities (with external help and not conditions) such situations cannot be corrected. I had a mind to go into the details of world free market economy but shall refrain from doing so. For ready reference only one point, I shall make and that is during 1980-85 increase in agricultural subsidy was 80% in U.S.A., 60% in canada and 21% in Japan. Whereas we were forced to withdraw agricultural subsidy in fertilizer, pesticides and power pumps. Only a well established consumer economy can successfully play with market force.

Birds, mammal, reptile, fish, crustaceans etc. for all of them have used national figures with no indications of the situation in the project area. The different so called exotic fish species introduced in Bangladesh almost 20 years now may not be identified as exotic any more, because they seem to have adapted very successfully and in any mitigation in fish resources these species are expected to play significant role

6.160 Regional Demography (p 3.3)

Area of Bangladesh has erroneously been entered as 134,000 in place of 144,000 sq.km..

Same page : What does it mean that "at liberation from Pakistan very few families owned no farm land". Does that mean life was better off. How about 50% population rise over base population in 1972 ? Or does it mean concentration of land holding in few hands are increasing ?

Not only flood embankment, roads or another structure needs land and that put pressure in an already land hungry country. Erosion and shifting of Jamuna to right - does it not take away prime agricultural land ?

6.161 Labour

1st and last lines seem contradictory. It is a peak seasonal phenomenon.

Nutrition and disease have received lengthy treatment while their correlation with FCD/I projects are still questionable.

6.162 P. 3-17

Planners in Bangladesh are aware that so called green revolution (HYV culture) has almost reached its peak and a major break through in agriculture is urgently needed.

6.163 P. 3-18 Navigation

Even without any intervention silt deposition will eventually render lots of navigation channel in operable.

6.164 P. 3-23, 3.6.6 conclusion

1st para - very true and are being taken care of under FAP. But the idea of dredging (2nd para) and the beautiful figures /quantification are questionable/fascinating as well, when not much of quantification could be seen elsewhere. The idea of extra storage and spillage delay is also not based of real situation. The effect will certainly be minimal (Jamuna or other major rivers have not been considered for manual dredging, I suppose).

6.165 P. 4-1 Assessment of Impacts

A very serious picture seem to have emerged and has been reconfirmed [(2nd para P 4-1) the conclusions in Interim planning stage] arising out of regional projects. This far I have not come across any mention of any project. The mention of "Green river concept" (whether a project or not was not clear to me) was the only form of intervention at lower Atrai (probably). Later Assessment Impacts have been tabulated for Mohananda, Lower Atrai, Hurasagar, Bangali Drain, Teesta right bank, Teesta left back. With no elaborating of Impacts (possibly FCD type intervention) assessment seem not to carry much sense to a reader (that is why I always urge to try and make each volume to some extent self contained). Number of Impacts - positive and negative listed under Table 4.1 (P 4-2) makes no sense to a reader who has no idea as to what are the impacts. To me Table 4.2 and Appendix G - has not conveyed much.

6.166 P 4-2, Section 4.2

Construction Resource Demand - " It will only be appropriate to analyze these during the feasibility studies and once the details of a proper regional plan become available". I don't really understand what this particular FAP issue. Is it not a regional plan study ? If so, who is supposed to prepare a regional plan ?

Demand of construction materials particularly hard rock, bricks and sand have been successfully quantified (Brick requirement) for "all the NWR projects:". That means all the projects are already clear and known to consultants. However, I failed to locate, understand and appreciate the projects and inherent impacts.

6.167 P 4-6, Section 4.4

Biological trend is again a motherhood lecture. 2nd para (P 4-7). The extent of human presence has upset the whole biological relationship ? So what should we do ? Export this extra population : If so, where?

6.168 P 4.7 Last 2 paras

No question about the rationale and need but how to achieve the same needs answer. Because of lack of background quantified figures, I find no point commenting on the same.

6.169 P-4-12 5th para Excavated Bengali drain

The problems arising out of the solution are more serious and that is exactly the problem with all other aspect. The Green River strategy is also fraught with similar merits and demerits as explained (P 5-2).

Under Risk and Hazard Assessment (P 5-13) " The experience in Bangladesh is one where integrity of embankment is the exception, rather than the rule". Very valid comment and EIA for any FCD/I projects under FAP as such has to go through the screening process of EIA practitioner. But the reasons need careful consideration. Resent World Bank estimate of coastal embankment rehabilitation has shown a 4 times cost compared to BWDB estimate to meet WB specification.
One more point about Bibliography: The consultants have consulted Prof. Aminul Islam's FAP study of Task force but have not mentioned the 4th volume on Development and Environment. The reason obviously is not clear.

VOLUME 5: GAIBANDHA IMPROVEMENT PROJECT - MAIN REPORT

Category 1

6.170 pS3, section 4 bullets and p4-5, section 4.2.1 bullets

The base option should include strengthening of existing TRE and BRE, retirement of BRE and work on structures (still to be retained or new) along TRE and BRE.

At the end of section 4 a paragraph could be added pointing out that there are associated developments some of which could be part of the project and refer to section 8.

Costs were allowed for the components mentioned. Section 4 describes components which were carried forward to full analysis.

6.171 following pS-6, figure 3 (and figure 6.1)

BRE works should be shown in Phase I.

While agreeing that completion of compartmentalisation could extend the implementation period to 11 years, some activities should be advanced:
It should be possible (and realistic) to advance II(b), III(a) and III(b) by two years.
Compartmentalisation (III(c)) should have a more quick-yielding programme:

- observations and modelling - years 1-3, with periodic updating subsequently
- public participation in planning and implementation - starting in year 1
- pilot compartment by year 4
- implementation progressively from year 6 to year 11.

Show associated development.

It is recommended to take 11 years as the implementation period in order to secure the time for data and information collection required of detailed design of the compartmentalization as well as the maintenance (and monitoring) period for the proposed river training works. On the other hand, it should be reexamined in the detailed design stage in compliance with the circumstance of GIP at that time. Since compartmentalisation works will be affected by sealing of the TRE, observations and modelling will have to await completion of the priority works.

6.172 pS-7, last para

If flood proofing is not more precisely identified/formulated and recommended for action as part of FAP2.1 or as an associated project, it may never be implemented.

Noted. Planning of flood proofing should be part of the next stage of the project. A tentative budget has been included.

6.173 pS-4

The project analysis should summarise the MCA and not just the economic analysis. Also, NPV should be presented and an estimate made of the employment losses in fisheries set against those gained in agriculture. The same comment applies to Table 5.1.3.

Section 5 and 6 together summarise the MCA. This has been expanded in the Final Report.

6.174 p3-1, section 3.1

The hydrology of the area and surrounding rivers deserve more than just one page. A justification should be given of the design criteria for the external embankments, the necessary improvement of the surrounding channels and of the internal systems for proper water management. Similar observations apply to sections 3.2.2 and 3.2.3, dealing with the flooding problems associated with the Brahmaputra and Teesta respectively.

6.175 p4-1, section 4.1

The various structural options for development need a more systematic discussion. It would be helpful to start with one or more base case(s), requiring one single intervention, and adding additional ones, one by one, discussing the advantages or disadvantages of each step. It should then be explained why a new Manos regulator, as part of a retired BRE should not also be considered.

Noted but not accepted. The discussion is adequate, if concise: further discussion would make the main report unnecessarily long. It can be found in Volume 6.

6.176 p4-9, section 4.4 (also volume 6, section 5.2.2)

This seems too simplistic a discussion for such a complicated subject. It is well known that efforts to stabilize the course of a river in one place may induce heavier erosion in others. A comparison of retirement vs. river training should therefore be based on a full understanding of the morphology of the river. Table 4.4 probably underestimates the requirements for training the Teesta. Figures 5.19 and 20 in Volume 6 are not adequate. What are the prevailing velocities and what is the expected depth of scour?

The impermeable groynes are planned to be provided at Belka, Sundarganji and Painalghat on the right bank of the Teesta. At these locations, there exist groyne built under BWDB, but most of these have been deteriorated. One the other hand, we confirmed through the site reconnaisance that significant erosion did not occur near the head of those existing groynes along the Teesta and that the deterioration thereof resulted mainly from inappropriate structual design and poor construction quality including use of unsuitable embankment materials. The local BWDB's office is doing the best effort to rehabilitate and in reality the existing groyne at Painalghat functions properly by means of protecting it with concrete blocks. On the other hand, a river width of the Teesta rive is narrowed to about 500m at the existing Kaunia railway bridge, the most upstream part of the GIP area, where embankments for the railway extend towards middle part of the Teesta as if they are certain type of groynes, although the Teesta has a river width of 2 to 4km except for the location. However, the river cross section surveyed at the location as well as the river profile shows that the maximum scour depth

is as small as about 5m. On the other hand, any erosion problems around existing concrete abutments at both bank sides are not reported to date, although the river flow is artifically constrained into such as narrow area. It has to be noted that length of the proposed groynes are less than 10% of the river width at every location. Thus, we are convinced that provision of the proposed groynes will not result in the severe erosion problems. Of course, we keep in mind that this has to be verified through physical modelling and that a range of maintenance works will be required after construction thereof.

Under the present condition, the scour depth for the design flood (20-year probable flood at each location) is calculated to be 3.4m, 6m and 4.2m at Belka, Sundargonji and Pinalghat respectively using to the Lacey's regime formula derived from river cross sections surveyed in 1992. While, the actual maximum scour depth is derived to be 3.6m, 4.3m and 4.9m at Belka, Sundargonji and Pinalghat respectively based on the river cross sections. As far as the river cross sections show, it is forecast that these maximum river bed erosion would take place just at the edges of flow area. Hence, the river bed protection works with placement of concrete blocks are planned to be provided over a width of 10m from heads of the proposed groynes toward the river side. Besides, a length of the river bed protection is usually taken at 10 to 15m in the standard design in Bangladesh.

As mentioned above, the proposed groynes were designed based on the intensive field investigation and data/information made available to date.

As responded hereinbefore, however, the morphological change caused by provision of the proposed river training works needs to be confirmed by the physical modelling test which is scheduled to be carried out in the detailed design stage, and based on the physical modelling the most economical alignment of the training works should be designed. Likewise, the erosion rates along the Teesta right bank should be updated applying the latest topographic data. It is usual and indispensable to review the feasibility study in the detailed design stage applying the updated data. Thus, a comparison of retirement vs. river training shold be made in the detailed design stage applying those data. Moreover, more economical measure may be adopted provided that they are to be developed by other FAP studies before implementation of GIP.

The groyne shown in Figs. 5.19 and 5.20 is designed in accordance with the planning criteria in Japan and the structural standards of existing groynes along TRE. In general, it is regarded that the structural design of this sort of river structures is of the experimental nature. As far as existing groynes along TRE are concerned, it is expected that the proposed groynes will function properly if they are to be constructed with improved construction method and well maintained after completion of construction. Since the river training works are planned to be provided in the 1st Phase of the GIP implementation, it is possible to maintain and improved those structures to resist the head erosion during the implementation period that is to last 11 years.

6.177 p5-2, section 5.2

The economic analysis will need to be revised to take into account the comments made on the Economic annex. These relate, in particular to the need to follow the GPA - carrying out the analysis in 1991 prices, presenting the NPV, using the economic prices given, changing the assumptions (e.g., on fish prices) through sensitivity analysis, not by arbitrarily making new assumptions.

See response to comment 7.14.

6.178 p5-7, section 5.3.5 to end of chapter - Social Impact Assessment

The social impact assessment section of this chapter needs to be revised and expanded. In a feasibility study, it is expected that consultants will identify clearly and in detail:

- the potential conflict over resource use between different social groups for each project option, giving details on how these conflicts will affect project operation, the numbers of households that will be adversely affected and the feasibility and costs of any mitigation measures;

- ways in which project benefits can be targeted to the rural poorest through e.g. implementation of the project through LCS, use of project facilities by the poor, involvement of women's groups in maintenance; and

- the income distribution impacts of the project are based on a survey representative sample of households (at present the consultants have only analyzed one village out of 6 surveyed) with details on key information (e.g., contribution of use of common property resources to the incomes of the poor; percentage of farm labour hired in by different classes of farmers). Where, as in the first survey village, sharecroppers cultivate much of the lower land, consideration should be given to the possibility that they may be evicted by landowners once the land becomes potentially more productive.

Details should also be given on the process of participatory planning followed by the consultants in assessing potential project impacts and the acceptability, or otherwise, of project options to the people.

In general this comment is not accepted. It seems to indicate lack of awarness of time and resource constraints. We will make further use of the data from the agro-economic survey. Other data mentioned can be found in other volumes, notably volume 11, Social Impacts. Details of the participatory planning were given in volume II Draft Final Report.

6.179 p6.3, section 6.2

Positive recommendations should be made for institutional arrangements for implementation; an organogram would help.

Noted. This has been included.

6.180 p-6-6, section 6.5.1

Preservation of khas water bodies should be studied at the same time as compartmentalisation planning.

Noted.

Category 2

6.181 S-2, para 3

"There is effective.....loss of land"
This should be the key elements of flood control works.

Noted.

6.182 S-2, section 3, The range of options

"Morphological consideration were also taken into account". How this was considered in your model and upto what extent?

6.183 S-5, para 2

"It should also be.....economic benefits".
How the cost of the new regulator will increase the total cost and IRR for the Project?

Constructing the regulator has a cost, which is included in the project cost. Its economic benefits are actually lower than its economic costs so that the project's IRR is reduced.

6.184 S-5, para 2

This analysis involves.....retirement of BRE"
The problem of bank retirement should be very carefully studied. BRE was constructed keeping sufficient set back distance. In many place the land in the set back distance has been lost in the meantime with poblems, like retirement of embankment, social problem like resettlement and increase of river width and morphological instability. Can this process of losing land and other problems be acceptable? In view of this bank protection/river training works must start henceforth even in a limited extent and be extended gradually in future.

Noted.

6.185 S-5, last para

There are some potential social implication to the option of compartmentalisation".
Negative aspect is of compartmentalization has been pointed out. Positive points are to be discussed and compared.

The paragraph succinctly describes the main benefits and disbenefits of compartmentalisation.

6.186 S-6, Para 7, Implementation

"A project Management Unit (PMU) .... perhaps with some foreign inputs".

Comments: BWDB surely have the expartise needed for technical support; and as such PMU can be manned by BWDB personnel. Some outside (Local) input may be necessary for the disciplines which BWDB do not possess.

An implementation period of 11 yrs is a high one for this project. This may be reduced with fresh analyses. Observation of erosion situation of Manas Regulator Site and detail design should be done simultaneously, in no case should be lagged by two years. Starting of Detail Design of III a,b,c components need not be awaited for 6 years.

It is doubtful whether all the expertise necessary for the PMU can be found within BWDB. Part of the intention of the project would be to promote co-operation between BWDB and other agencies, local NGOs etc.

Noted. However, overall 11 years is a reasonable time scale, allowing scope for further study and planning.

6.187 following p3-5, figure 3.1, and p3-9, para 3

Were there any consultations with people on chars or along main river banks? If so locations should be indicated in the figure.

See volume 11 for more details.

6.188 P 3-5, 6th Para

"The community and others nearby are "trapped" between the road and the Satdamua-Katler Beel Embankment on the Left Bank of the Ghagot".

Comments: A proposal in the name of Ghagot river F.C.D. Project is now under study by DPS-IV (EIP). The problem mentioned may be looked into during the study of the proposed project. At present the study is kept pending and the final report of the North-West regional study and Gaibandha Improvement Project under FAP-2.

Noted.

6.189 p3-9, para 4, last sentence

Clearly strengthening of TRE and BRE should make provision for household berms.

Noted.

6.190 P 3-11, Para 6th

"Dismantle the EIP embankment on the left bank of the Ghagot".

Comments: Benefit of the project due to embankment on the left bank of Ghagot river is there. So, the question of dismantling of EIP emabnkment does not arise. Is it really desired locally?

This is a correct record of findings in one locality. In this case the locality was on the right bank of the Ghagot. These findings illustrate the difficulty of planning FCD schemes because of adverse impacts on adjacent areas. The FAP2 plans for Gaibandha try to address these issues.

6.191 p4-5, table 4.3

On which 10-year period is the table based? Why 10 years and not 25 years as for the with project case, section 4.2.2, para 1 (should read without-project?)?

6.192 p4-6, section 4.2.2, para 2

1987 is more than a 'typical higher flow' year. Its severity should have been discussed in section 3.1.

6.193 p4-7, para 1

Have the same (which?) 25 years been used for the 'without' case? Why has the sensitivity of various assumptions been tested with 10 years' modelling?

6.194 p5-4, para 1, table

Why is HYV boro limited to 48% if, as stated elsewhere, irrigation is not a constraint? The limitation needs to be explained. (Also, the list is not a cropping pattern. It would, in fact, have been useful to have shown crop allocations by F land types, also differentiating between permeable and impermeable soils).

The reference year for the analysis of project impacts is 2007, i.e. the year (approximately) when full development would be achieved. The consultants project an increase in irrigation from 29% to 48% of NCA between the present and the year 2007. This does not exclude further expension of irrigation and HYV boro cultivation in subsequent years, but such expansion is not relevant to the analysis.

6.195 p5-6, bottom para, last two sentences

For a feasibility study, costs and benefits of mitigatory actions should have been assessed.

As noted in the text, a fisheries development plan is proposed and costed in chapter 6, but it is regarded as an associated development rather than part of the core project being analysed.

6.196 table 5.4, footnote

Jute has an important economic value as fuel and housing material, which should be included.

This value is included, as explained in the footnote.

6.197 p5-19, sub-section removal of Manos regulator

Removal of the regulator will allow unrestricted fish migration - but into a confined river. So no great benefits unless there are provision to let the fish into the floodplains.

Noted.

6.198 p6-3, para 1, line 2

Relationships with local government and other development agencies in the project area also need to be addressed.

Noted.

6.199 p6-3, para 3, last sentence

This form of 'coordination' seems unlikely to succeed: who would coordinate the coordinators?

It has a better chance of succeeding than large project communities, which actually never meet. It is accepted however that there will be a need for overall co-cordination, which would need to be at DC level. An organogram of a possible institutional format is included in the Final Report.

6.200 p6-3, para 4

Add new bullets:
'- ensuring consultation with the public'
'- coordinating associated development activities'.

Yes.

6.201 p6-4, para 6, lst sentence

It might be more appropriate to involve zila councils, if and when formed. Inclusion of MPs could lead to politicization of issues.

Noted, but politicization of issues is an inescapable part of a democratic process of development.

6.202 p6-6, para 3 (and para 6, borrow pits)

Beels in Gaibandha commonly have a sandy substratum. Therefore, they may be drained by withdrawal of groundwater by STWs/DTWs, and desilting could expose the sand. Earlier, there is a reference to tanks not holding water for this reason. Prior site examination would be necessary before committing funds to such 'improvements'.

Noted.

Category 3

Category 3 comments are noted, unless otherwise

6.04 p1-1, para 1

Part of the project area lies in Rangpur district (as shown on Figure 1.2).

6.205 p2-1, para

Ditto.

6.206 p2-4, Table 2.3

The differences between the 1991 and 1989 columns deserve comment in the text.

6.207 p2-4, para 1, line 3

The main reason is that physical conditions for growing jute are good: marketing and purchasing centres followed production.

6.208 p2-4, Table 2.4

Clarify whether rice yields are as paddy or as milled ;rice, and whether they are averages or represent yields in 'normal' years. See comment on Agriculture Annexe, Table 1.1.

Rice yields are paddy in "normal" years.

6.209 p2-9, para 2

Add Gaibandha-Fulchari Ghat spur railway line (show it on maps).

6.210 p2-15, bottom para, line 4

Trees are generally supposed to weaken embankments, not compact them!

6.211 p3-3, para 1, last sentence

Not all places referred to in the following text are shown on the map.

6.212 p3-10, para 2, last sentence

The Union, which has people's representatives, may now be more appropriate than the thana for reconciling local differences.

6.213 p3-10, para 4, lst bullet

'transectional', not 'transactional'. (Also elsewhere on same and following pages).

6.214 following p4-4, figure 4.2

Option P should not include the Manas regulator.

6.215 following p4-6, figure 4.4

Bank levels should be added.

6.216 p5-21, para 4, line 4

Presumably 'low quality soil'.

6.217 p5-25, para 4, line 2

Is it implied that 'seeds of conflict' are 'a feature of properly conducted socio-economic surveys etc.'? (Line 7): a salish is not necessarily an individual.

6.218 p5-17, tables

Clarify that the figures are percentages.

6.219 ditto, second table

It is unclear why for medium farmers there should be no change (47%) of F2 land. Also, the statement below the table is misleading. The net result may appear that loss of F2+3 land is offset by an equivalent gain of F0 land, but this is a coincidence: reduction in flood levels would change F2+3 land mainly to F1 land and F1 land to F0 land.

6.220 table 5.11

In the 'per farm land' columns, explain the gap between net land and total.

Net land should not appear in the table: it is only in table 5.11A (II is the land sharecropped by the sample of 5 farmers, whereas the table is on a per farmers basis).

6.221 p5.11E

Large farmers would almost certainly not cultivate all 8 acres directly. Possibly 2-3 acres would be farmed directly; the rest would be cultivated by tenants (either on share or lease terms). Costs and returns need adjusting accordingly (as they have been done for tenant farmers).

6.222 p5-28, paras 1 and 2

This applies only to share tenants, not to lease tenants (who are interested in maximizing yields).

6.223 p6-6, para 4

Is fish stocking a one-off cost or an annually recurrent cost?

6.224 p6-11, para 3, line 1

'slopes towards southeast'.

VOLUME 6, GAIBANDHA IMPROVEMENT PROJECT - ENGINEERING

Category 2

6.225 Page 4.3 (b)

Under the condition that TRE is properly handled, do you think the existing regulators and sluices is of in sufficient capacity due to influx of excessive rainfall.

The drainage analysis carried out applying the planning criteria clarified that the drainage capacities of existing regulators and sluices in the GIP area are still insufficient for draining out influx corresponding to the design rainfall (5-year probable rainfall), even though TRE is completely sealed.

6.226 Page 4-3, section 4.2.1 (8th to 10th line)

"Figures 4.1 shows.....estimated".
It appears unusual to have such average bank erosion rate leaving bank line as shown in Fig. 4.1

Those rates were estimated based on the previous photographs taken between 1983 and 1990 and were considered applicable to the present study. As mentioned in the "Response" to "Comment 5.14", it is recommended to carry out further studies thereon in next D/D stage so as to verify the adequacy of those rates.

6.227 Page 4-5, Para 1 & 2

How do you endorse FAP-1's recommendation for repeating retirement of existing flood embankment taking into account only the degree of flood damage. What about land loss, social problem etc.?

The consultants do not endorse embankment retirement for the TRE, partly because of social problems etc. FAP 1 has primary responsibility for proposing strategies for the BRE, where its (financial) costs of maintaining existing alignments are much higher than for the TRE.

Comments made by River Research Institute

6.228 The provision of Gaibandha Town Protection by short-cut channel may be finalized after having physical model study.

Regarding the short-cut channel, it is not considered essential to carry out the physical modelling in next D/D stage taking into account the comparatively short length of new channel to be built. However, its necessity should be examined in preparing a TOR for next D/D.

6.229 Compartmentalization in the GIP area may raise problems in other sectors. Advantages of the Project have been highlightened by the Comsultants which need to be carefully weighed with respect to the adverse effect.

We agree that in relation to the compartmentalization of the GIP area the adverse effects needs to be carefully examined by the engineering and non-engineering disciplines in next D/D stage.

6.230 Study on the existing flood control infrastuctures and possible future options require physical modelling (for verification/modification of the results obtained from mathematical modelling).

Except for impemeable groynes, it is considered not necessarily essential to carry out the physical modelling for the study on existing flood control structures and future options as long as the hydrological data are collected to sufficiently clarify the hydraulic phenomenan in the GIP area (we proposed in Volume 6 to carry out the hydrolocal observation during next D/D stage which is going to last 11 years), since existing hydraulic structures as well as those proposed for GIP are of small scale and usual type. However, its necessity should be examined in preparing TOR for next D/D.

6.231 One of the causes of flooding problems is drainage congestion at the down-stream of Ghagot river. If TRE is sealed and embankment is constructed along the Ghagot, then will this drainage congestion be released? Further study appears to be required.

At present, the Ghagot river carry surface runoff from the Ghagot and Manas river basins, and sometimes from the Teesta river when breaches in TRE occur. It is clarified through the hydraulic modelling that sealing of TRE will reduce considerable depth of flooding at the entire reach of the Ghagot. The proposed Option is drawn up to enable the GIP area to have a protection level of 20 years against those surrounding rivers through sealing of TRE and provision of emabnkments along the Ghagot and regulator on the Manas at the outfal.

Besides, other main causes of drainage congestion at downstream of the Ghagot are insufficient carrying capacity of the Alai river and insufficient drainage capacity of existing Manas regulator. The proposed Option also comprises provision of regulator on the Alai and provision of short-cut channel to connect the Manas and Brahmaputra so as to solve those flooding problems. The effectivemess of the proposed Option for GIP is certified through the hydraulic modelling analysis.

6.232 The design of the proposed impermeable groynes (Fig. 5.19, Vol. 6) may be checked by physical model study. Recent studies show that groynes with falling apron, work better in order to protect scour at the toe of the structure.

We entirely agree to this suggestion and proposed in Volume 6 to carry out the physical modelling in next D/D stage.

6.233 In the hydraulic studies for the priority project area, physical model study may be taken up in addition to mathematical modelling before final recommendation (Ref. Vol. 9).

Noted.

VOLUME 8 - EIA , GAIBANDHA IMPROVEMENT PROJECT

Category 1 Comments

6.234 In general this EIA report is an abbreviation of IEE report of the Regional Study (Vol. 4) and Ecology Vol. 14. Why a summary needs to be produced as a project level EIA from IEE is not clear.

There are some very useful data and information available in the report particularly about the adjacent Charland People, unfortunately that area is not part of this report considerations. Profuse use of information from FAP 14, FAP 3.1 (FAP 3) are good but why so many pages should be used for the people and area where resources, time and manpower are already inadequate, as claimed by the consultant.

This volume is the EIA for the Gaibandha project. There are many points at which information in the IEE is also relevant to the EIA. However the EIA contains, in addition, a great deal of material which is specific to the Gaibandha project.

Category 2 : Comments

6.235 p 2-2, Section 2.2.3, Technology Options:

Establishing biological criteria is difficult under Bangladesh context. Even if the engineers were aware and sympathetic (which they are most likely now) of the situation what they could really do? If they could do something then why "from an ecological view point, however, they are almost barren with extremely low species diversity" (4.4.3 Major Terrestrial Habitats - Croplands P-4-9)?

6.236 p 4-3 1st para

GIP area supports a present population of 550,000 people.

6.237 p 4-16 last para

Population of the area of GIP is approximately 670,000 people.
Which of the two figures are correct ?

6.238 p 4-6, Section 4.3.6, Ground water

What is Iron toxicity ?

6.239 p 4-9

What will be the probable increase in t. aman once HYV is introduced. Otherwise how the economic analysis has been carried out.

6.240 p 4-11, D.O. level 6 mg/l

If that is what is the final figure (I have not seen the set standard) then my presumption would be that DOE wanted to be sure that D.O. level in surface water should be high enough so that faecal pollution (which depleted D.O.) in minimal. I feel it relates to surface water.

6.241 p 4-11, 4th para, last lines

Water quality in response to use of fertilizer refers to what water surface or ground ? Any *quantification.*

6.242 p 4-14, 3rd para, causes of Fish Diseases

There is another cause which create ulcer in the fishes is - the use of current net locally known as current jaal. The current net is made of very thin and sharp thread which can easily create wound and infection on the body of fishes when they come in contact of that net and escaped.

6.243 Table 4.4. (P 4-16)

Literacy figures do not match with 1991 census figure refereed to in IEE figures. 1st para in p 4-6. Landless population are expected to be more in urbanized area. IEE report indicates as high a landless population as 75% while total and functional landless people amounts to 52%. The figures may be checked.

6.244 p 4-18, 1st para

What was the reply of charland people after fifteen minutes should have been presented.

6.245 Section 4.8.2

Water-Related Diseases (P 4-24) "Vectorborae disease reviewed in the IEE those that can be confidently predicted to be of concern in GIP include Malaria, Kal-Azar, filariaris, Japanese encephalitis".

6.246 p 4-25

Excepting Malaria no other disease could be established from record or information.

6.247 p 4-26, 4th para

High level of mental illness in Bangladesh is on increase compared to other developing countries. Any quantification/indications or statistics from other developing countries available.

6.248 Last line same above para

Exactly the same comment was questioned by me in FAP 14 report, if I correctly remember. Such sweeping remarks need careful considerations.

6.249 Endemic Goitre (P 26)

The idea of "including a small programme as an additional component" is an excellent idea and should not pose a problem (Piggy back addition).

6.250 p 4-27, Section 4.8.3, last line 3rd para

What is the figure 270-64?

All the problems of using clean water, nutrition, disease emanating from Water use etc. needs health education and UN agencies like UNICEF and other NGOs are working in this line (soft ware approach).

6.251 p 4-29. 2nd para

Very correct and appropriate, but that requires redirection of policy issues over which we have little control. The various health problem, nutritional and dietary deficiencies concludes that fundamentally hunger is the biggest problem and situations are just manifestations of the inherent problem. Unless remunerative employment could be ensured discussion on other problems will be academic exercise only. All projects as such should look into that aspects seriously and ways spelled out.

6.252 p 4-36

Again like IEE report a very well known and well established fact has been discovered by the consultants " The study confirms that the transportation of Jute is not as economic by truck as by boat".

Migration of minorities to India has been mentioned due mainly to various social stress and displacement from traditional trade/ occupation. Have the consultants found a very serious situation arising out of it or this is usual out and in migration in boarder areas.

6.253 p 5-4, Section 5.3, Impact matrix

This was the part I was interested to see the adequacy or otherwise but find myself in a position not to comment at all. Without any quantification at all IEE level assessment do not really satisfy the requirements for an EIA.

6.254 p 5-7, Section 5.4, Impact quantification and valuation

Does really contain any quantified or valued figures ?

6.255 p 5-16, Section 5.10.4, Sustainability

I would have loved to see a little more justice done to this section. The two very important conclusions claimed to have found should have been discussed and ways to overcome the same should have been elaborated. If the consultants honestly feel that there is a need of redirection of thinking they should put forward logic and reasons for the same.

6.256 Page 6.1 Risks and Hazard analysis

Soil erosion is also a hazard which imply risk to the stability of embankments. Three types of erosion such as (i) sheet erosion, (ii) wave erosion and (iii) current erosion, causing major problems in the embankments and khals of a project that may be FCD-I.

Soils of the embankment are eroded by rain, wave and current action, if good turf is not grown.

The programme of biological system of protection of embankments by other than turfing where turf does not grow well or good turf is not effective may be considered.

6.257 p 7-4, Section 7.4.3, Fuelwood and Fodder Production

This is exceptionally important aspect but has received little attention compared to other sections.

VOLUME-9 : HYDRAULIC STUDIES

Category 2 : Comments

6.258 p 5-5, para 1

The justification for adding the artificial channels in the flood plains in not clear. Are these artificial channels a lumped representation of small channels in the flood plain?

Cross-basin flows were identified during field visits and these can only be represented in a 1-D model by flow links between adjacent basins. They represent drainage routes for cross-basin overland flow.

6.259 7.245 p 6-8, para 3

Calculation of cropping pattern using the 1 in 5 year return period water level may not be a realistic approach. This is because the 1 in 5 year water level may not simultaneously at all locations in the study area. Thus the return period of water level may vary with the location during a flood in a year. The alternative procedure discussed in the next para seems to be a better approach.

Noted. As the Lower Atrai is dominated by backwater influences and very shallow water surface slopes the two approaches are likely to give similar results. However, we did use 1 in 5 year levels at a number of locations to define flood phases in a project area.

6.260 p 9-1, para 2

Averaging the ranks of year among the nodes in a planning unit may not be a correct approach. The rank of a year is an indicator of the return period for that year. The return period is not linearly related to the water level. Thus averaging the ranks is likely to give biased results. An alternative approach in to average the water levels among the nodes in the planning unit in a year for each duration. Then based upon the rank of the average water level in a year, the return period for that year can be obtained.

The ranking system was only used to select a set of design years for looking at options. In the final analysis design levels were based on a full 25 yr run and return period levels calculated from the modelled time series.

6.261 p 9-1, para 3

It can be tested using the approach suggested in the previous comment whether the estimated return periods of the selected years vary as widely as 11 to 39 years.

Noted. A suitable range of return periods was required for the analysis of options rather than a specific, exact return period.

6.262 p 11-5, para 2

Removal of flood plains should be justified by actual physical condition. Getting agreement between computed and observed water levels should not be the sole objective by ignoring the actual physical process. If the flood plains are really attached to the Ghagot, then they should not be removed.

Model simulations indicated that the active floodplain width was less than the full width of the artificial floodplain attachments. These artificial floodplains do not represent the spatial variation in floodplain level. Beel areas to the west of the Ghagot therefore gave a false indication of the conveyance capacity of the floodplains adjacent to the river.

6.263 7.246 p 13-1, para 3

See earlier comments related to page 9-1.

Noted. See reply related to page 9-1.

VOLUME 10: HYDROLOGY AND GROUNDWATER

Category 1 Comments

6.264 Considerable Hydrological analysis have been done which is appreciable. Detail methodology of the analysis should be included in the report and made available to this office.

Noted.

Category 2

7.265 p H-8

It has been mentioned that 10 days 50 years rainfall of 3 Atrai has dropped from 980 mm to 570 mm. It should be mentioned how and with what rainfall of 980 mm was computed. The period of data used for each table should be mentioned.

It has been mentioned (table 3.2) most of the results of rainfall analysis were close to those presented in interim report except a few instances where there are differences due to deletion of erroneous data. The erroneous data should have been identified specifically during preparation of Interim Report and brought to the notice of the Chief Engineer Hydrology/appropriate authority before deletion and analysis of data. It is requested that error of data if any should be mentioned specifically for necessary correction from Hydrology. Specific detection of erroneous data will be appreciated.

The working paper No. 6 which was circulated and submitted to FPCO states clearly the methodology followed.

6.266 p 11.10

It has been mentioned that it is necessary to remove trend of annual HWL before frequency analysis. It should have been mentioned in the report how this trend has been removed before doing the analysis.

The last sentence in the para answers the question.

6.267 p H-18, para 4

It has been mentioned that for return periods of water level within the length of the data set estimates were based upon interpolation of plotting positions, while for longer return periods the Gumble distribution was employed. The approach is not consistent. The plotting position gives an estimate of the exceedance probability (or return period) while the fitted distribution gives an estimate of water level corresponding to a given exceedance probability (or return period). The fitted Gumbel distribution can be used to estimate design water levels for both within the data length (interpolation range) and outside the data length (extrapolation range). If the return period in estimated from the fitted Gumbel distribution, then the correction for expected probability is to be applied.

Only Gumbel extreme value distribution was used. So, correction may not be required.

6.268 p H-19, para 2

See earlier comments related to page 9-1.

6.269 p H-19, line 15

Replace '??' by the appropriate planning unit number.

Noted.

6.270 p H-20, para 5

Generally the computed discharges not computed water levels would be affected due to inaccurate rating curves. Has the rating curve been specified as an external boundary condition in the model simulation?

In general, discharges are specified at upstream boundaries and water levels at downstream boundaries in the model. Where necessary, ie for missing data, rating curves were used to generate discharge timeseries from the available water level records. Where ratings are poor, these would produce poor estimates of the input discharges at the model boundaries and lead to poor model water level predictions at the boundaries.

6.171 The assessment of return periods, as experienced on p, 11-18, Volume 10, could be misleading. As figure 8.1 clearly illustrates, the data on extreme annual levels in fact constitute at least 2 and possibly even 3 different populations, depending on the configuration of the river bed. It appears that at a level of apps. 18.5m a different population exists, possibly because overbank flow starts to become significant at that level. Above that level the data form again a homogenous population and it should not come as a surprise that, as a consequence, they fit a Gumbel plot. However, if in future embankments would be constructed at not too far a distance from the riverbank, then also the higher levels would tend to follow the sleeper plot of the levels below 18.m and as a result levels of given probability would be considerably higher than for the situation without embankments.

Yes, the procedure brings in more homogeneity as the figures are likely to have more members from same population which may be the overbank level. So, under the existing condition this is more likely event but under embanked condition these are not likely to apply. Under embanked condition again all data will not be in same population rather there will be different population which may be differing from the existing ones. This has been taken care in with project condition in table 8.11. comparison of table 8.10 and 8.11 shows the difference between the expected future and present condition. The future condition shows a general increase, wherever embankments have been put along the bank.

6.272 Table 7 Volume 10 (see also p G 1-8) indicates that flood protection has a considerable impact on the potential recharge of groundwater, which is rather surprising, since other regional studies came to different conclusions. Even more surprising is perhaps that controlled flooding had very little impact. The consultant would have to explain these results and indicate if there are other means to improve recharge if 'normal' controlled flooding does not helds.

Yes, potential recharge will be significantly reduced. But a large portion of this is rejected recharge. At times standing water level, depicting the surface water level, represents the water table. This is evident from figure 6 in volume - 10. But this will not significantly change the available ground water as the level at the commencement of irrigation season is the same in both the conditions. As available recharge is not affected, no improvement in recharge may be necessary to keep the present state.

VOLUME 11 - SOCIAL IMPACTS

Category 1

6.273 The inclusion of the overall objective of the study and the linkage of this part to the main study will help the general readers of this volume.

6.274 Excerpts of this chapter may be circulated to various nation building departments, womens association etc. for their information and possible action for mitigating human sufferings. This recommendation is made for FPCO.

6.275 pii, Section: Methodology

A very desirable and a well articulated paragraph.

6.276 p1-3, Section 1.2

The section on 'Socio-economic Features of the North-West' is rather weak for a regional planning study. A considerable volume of secondary data exists for the region (e.g., in the 1983/84 agricultural census) which could be used to provide a socio-economic framework for the study. The use of data from only the 11 thanas covered by the Upazila Development Monitoring Project, with no assessment of how accurate these data are? (who commissioned the study? who carried it out?), is surprising. Since Gaibandha is supposed to be a feasibility study, section 1.3 (p 1-7) is inadequate. Estimates of the accuracy of the fisheries data (p1-10, para 3) also needed.

The comment is noted. The fact that data from the 1991 Population Census were not available, as had been expected, hampered the study. FAP17 is reviewing the accuracy of fisheries data in general.

6.277 p1-10, para 1

Here, and at other places in the annex, there is a tendency to use rather negative language. Yes, it is true that the landless do obtain far less benefit than the landed from land-based development projects (including irrigation) but the benefits they gain can be as high, as a percent of their income, as those of the rich. Another example is p2-6, para 1 where all the adverse impacts of polders are listed, but positive ones in Fig. 6 are ignored (e.g., apparently improved boat transport and reed collection).

The fact remains that per household incomes will become more unequal as a result of FCD: it is reasonable to point this out.

6.278 p2-2 - Chalan Beel Survey

By focussing the sample on the poor, was it possible accurately to assess conflicts over resource use between different social groups? Also, how useful are 'before' and 'after' polders questions (e.g.,

Fig. 5 on agricultural employment), if this took place long ago and if other factors (e.g., population growth, regional trends) are not taken into account?

The purpose of the survey was to identify survival strategies of poor households and to find out how flood control affected them. Other issues, such as conflicts over resource use, were investigated using RRA approaches.

"Before" and "after" questions are useful indicators of trends in a qualitative sense.

6.279 p2-17, 3rd Para

This shows that these people do not necessarily need the services of expensive NGO operatives for more than a specified short period. NGOs can help them to identify resources and use these to their advantage.

Yes - good NGOs do this, but in some areas it takes longer than others.

6.280 p6.7, Section 6.3

Here the role of the Departments of IRDP, Social Welfare. Cooperatives, and income generating programs of NGOs is vitally important. As such the Consultants may focus on this option. Is there any NGO in the area to help these poor households and what has been their programme outcome?

Some small NGOs are working in the area, for example on base health care, literacy, and income generating activities. It is likely that these NGOs still only reach a relatively small proportion of poor households.

6.281 Chapter 6

This is too general and does not fulfill the requirements of the SIA annex of the GPA. Our main concerns are that insufficient detail and analysis is presented on:

- potential conflicts between different interest groups and how these may affect project viability (especially in the Gaibandha project);
- the 'winners' and 'losers' of the different project options with emphasis on the income distribution impacts (see comments on Economics annex) and especially those groups which will be especially adversely affected (e.g., professional fishermen; those whose land is acquired);
- the potential for targeting project benefits to the rural poor, especially poor women (e.g., via LCS, leasing of project infrastructure - embankments, borrow pits);
- the design and costing of any mitigation measures that are needed to offset adverse impacts (e.g., resettlement and rehabilitation programme.

In general the consultants feel that, in order to meet the requirements of the SIA annex,, more time and resources are required than were available to the study. It is also felt that, in general, the points raised above are adequately covered at different places in the report (Volumes 5, 11 and 13), but that more work particularly on the last two points should be done at detailed design stage. One of the functions of the proposed PMU would be to develop practical ways in which project benefits could be targeted to the rural poor.

Category 2

6.282 p1-1: Table 1 and 2

Source of data be mentioned.

BBS Census

6.283 p1-3: Section: 1.2, Housing & Drainage

Why this wide variation?

The point being made is that poorer communities have less access to clean drinking water.

6.284 p1-3: Section 1.2, Literacy & Economic Activity, Para 1

The statement does not corroborate with the table on page 1-4.

The comment is not understood: there is clear corroboration between the statement and the table.

6.285 p1-6, Last para

Any explanation? Was the madrassah/maktab education taken into consideration?

Not as a separate category but they would be included in the overall numbers of schemes.

6.286 p1-7, Para 3, Sentence 1

Farther elaboration of the sentence will be helpful.

i.e. a large number of people are competing for a high percentage of the marginal land.

6.287 p1-9, para 2

While describing the characteristics of the people it is necessary for an investigator to find out the communication system operating in the area with special reference to the mass media, Radio is of particular interest in this situation.

Good point - should be included in future surveys.

6.288 p2-1, Section 2.1, lst para

The consultants recorded 65000 villages in Bangladesh while the government works on the basis of 68000 villages. Is there any reason for not using the GOB data?

In the absence of a fully exact figure, it seemed safe to say "more than". Point, hower, noted.

6.289 p2-1, para 3

Bangladeshi villagers cannot be said to have 'control' of floodwater. They have adapted to it (e.g., plinth heights and cropping patterns) but do not control it.

6.290 p2-2, para 3

Details on the sampling method used should be given.

6.291 p2-2, 3rd para

It is stated that "small farmers with less than one acre" and the landless, were the respondents. But in Agro-Socio-economic survey, the small farmers are those who have cultivable land from 1.01 to 2.50 acres. So, the term may be written as "armers with less than one acre cultivable land."

6.292 p2-3, Fig. Organizational chart of BWDB

The Figure is a back-dated one and need up-dating with relevant corrections.

6.293 p2-5, para top and bottom

To what extent the loss as described in the top para is compensated by the benefits as described in the bottom para?

6.294 p2-8, Fig. 8

How do the consultants account for the highest rates of outmigration in the month of HYV boro transplanting?

6.295 p2-8, para 3

Another example of negative bias. The fact that outmigration still continues should not be used to argue that the poor have not benefitted from non-agricultural growth. Outmigration could have been very much higher without it. Provide evidence for assertions.

The text states that the poorest have not noticeably gained, which seems a reasonable statement to make on the basis of the migration data. This is not negative bias.

6.296 p2-10, section 2-4, lst para under Men, last line

Loan sharks is not the correct translation of the Bengali term Mohajan (meaning a village money lender).

Noted.

7.297 p2-9, Section 2.3, Paras: 1, 2 & 6

These problems need be attended to by this FAP.

The proposals for the Gaibandha Improvement Project are inlended to achieve this.

7.298 p2-9, Section 2.3, Para 4

How far this view of the people is correct in terms of hydrological point of view?

In general there was usually fairly good agreement betweent he view of the local people and the technical staff on the consultants team.

6.299 p2-19, Section, Para 1 under "Men"

Any discussion that took place on what is to be done for public cuts of the structure? And how to 7.281 handle such a situation.

"Cuts" in this case refers to "breaches", not public cuts.

6.300 p2-30 para

The issue of relief needs a thorough discussion including its nature and scope, and finally discussion on the impact of relief distribution vis-a-vis concept of self-help.

6.301 p3-2, para 1

It is perhaps dangerous to claim too much and to criticise others for being 'gender blind'. Especially since, on p3-9, the consultant seems to play down women's productive roles, ignoring their critical importance in post-harvest processing of paddy (e.g., parboiling and husking) prior to sale or domestic use. Also on this section, why do the columns in Table 1.p 3-4 not add up to 100?

Comment noted. The figures in the table are numbers of respondents, not percentages: one respondent could report a number of survival strategies.

6.302 p4-2

A 'shift from T to B aman' is not available as a flood survival strategy. Once the flood has come, a farmer may be able to transplant a crop as it recedes, but not broadcast.

This strategy is feasible as a longer term risk aversion measure - it is not proposed as a strategy immediately post flood.

6.303 p4-4, para 4

Again rather too much is claimed for sociological approaches. The idea that sociological inquiry 'faithfully reports what the families and communities reveal' is perhaps somewhat over-stated. Sociologists may try to do so, but there are always difficulties in this.

6.304 p2-20, section 10, Para 2, under "Women"

It shows that village women if trained in simple health education, the health of the child and the mother will be better than ever.

Yes

6.305 p2-22, para 1

Different villages defines "severe floods" differently. As such all public discussions and planning efforts need to take cognizance of this variability.

6.306 p2-22, para 2

This para could perhaps be further expanded. Wonder, if the consultants have probed into this issue.

Category 3

Category 3 comments are noted unless otherwise indicated.

6.307 p1-1, Table No., National Demographic Characteristics

Area of Bangladesh has been shown as 134000 sq. km. which is not correct, which may be corrected as 144000 sq. km.

6.308 p1-2, Table 3, Population by District North-West Region 1991

Area of North-West Region is shown 35,592 (sq. km) but it is shown in Table 2 as 33 thousand (sq. km). Which one is correct?

6.309 p1-3, Section 1.2, Literacy & Economic Activity, para 1

What factors have contributed to this situation? Wonder if the consultants could throw some light on it.

6.310 p1-4: Table

"Upazilas" be replaced by "Thana".

6.311 p1-7, para 1

Whether reasons for this variation could be added here?

6.312 p1-7, para 2

Whether one can conclude that the existence of a large number of temples in Ishurdi connotes large number of Hindus still living there. It is quite likely that Hindus, in large numbers, have already migrated to India after the partition of 1947.

6.313 p2-1, section 2.2, lst para, last line

Is there any reason for mentioning "Hindu"?

6.314 p2-3, para 2, last 3 sentences

A detail discussion on this issue will help.

6.315 p2-6, para

Where the problem lies?

6.316 p2-7, para

Any attempt made to overcome the problem?

6.317 p2-8, para 4

What is the proportion of the population who live inside the polders and those who live outside?

6.318 p2-8, para 5

Is it possible to have a short evaluation of the feasibility report?

6.319 p2-16, section 6

While the landownership pattern of village 5 and village 6 is the same their expressed problems are not the same? Any explanation?

6.320 p2-21, section 2-5, para 6, line 2

Typographical error.

6.321 p2-22, para 5

What is the estimated population and or the proportion of the population who were benefitted by the TRE? Is it possible to indicate the variability of benefits to be accrued by different villages.

6.322 p2-23, Section 2.6, Para 2, Last Sentence

This should be recommended for other areas.

6.323 p6.3

Upazila be replaced by Thana.

6.324 p1-2, Table 3

The data on area is not in '000 sq. km.

6.325 p1-8, Table 5

Show last column as % change too.

6.326 p1-9, para 1

Yes, fertilizer is expensive, but farmers use it because they get good returns to its use.

6.327 p2-21, a + para 3

All households have land? Aus is a rice type not variety.

VOLUME 12 - AGRICULTURE AND FISHERIES (AGRICULTURE)

Category 1 Comments

General Comments:

6.328 The consultants have set up their own flood-tolerance criteria instead of following the established MPO criteria. Criteria for transplanted deep water aman, not covered by MPO, were discussed and cleared with a POE members, but the changes made for other crops were not (although they are fully explained in the text). The changes made are not endorsed: the tolerance limits are generally too high, and the MPO criteria should be used. Additionally, crop yields under present conditions appear to be too high, probably because they do not represent average conditions. Accordingly, crop areas and production, with and without project, need to be revised.

The flood-tolerance criteria have been the subject of on-going discussion between the consultants' team and PoE members (see Appendix 2). Moreover, as a result of more recent discussions, the consultants team adopted with a modified MPO approach (see the detailed discussion in section 5.2.2 of the volume) which used MPO flood tolerance criteria. This approach was also used in the Gaibandha analysis.

We committed considerable resources to gathering data on yields and believe that our estimates are reasonable, bearing in mind that crop damage is separately accounted for. The crop yields given are therefore those for "normal" years (i.e. without major crop damage).

Overall we hold our analysis to be correct within the normal levels of accuracy which one would expect from this type of planning (pre-feasibility level for the regional plan, feasibility level for the Gaibandha project).

6.329 Comments has been made in the report about MPO data base and assumptions without knowing the same. The criticism that crop allocations were made without considering time series water level is not right. If that would have been the case then local varieties of transplanted aman would not be allocated to F2 land type. Similarly HYV Aman would not have been allocated to F1, land type.

See response to comment above, NWRS acknowledges the basic soundness of the MPO approach, while believing that it can be further refined.

3.330 It is not desirable that different FAP component study develop their own standards. There is a need to maintain consistency following standard classification. Instead of trying to introduce new standards let us stick to the standards set by MPO. This is essential for maintaining uniformity across the Flood action Plan.

See responses above.

6.331 Report on Gaibandha Project, Annex 1, raises the question of the level of study. It does not meet the requirements of feasibility level study. It is advisable to collect primary data through intensive field survey before proceeding any further.

A detailed agro-economic survey of 210 farmers was carried out in the Gaibandha area. However, this has been used primarily for financial analysis of project impacts. Aggregate cropping pattern data were derived using the modified MPO approach. These cropping patterns are shown by land type (Fo, F1....) for without-and-with-project conditions.

Category 2 Comments

6.332 Page A-2 : F classes after 3rd para

Both F3 and F4 classes are flooded in excess of 1.8 meter, F4 being the area where depth, timing or rate of rise of flood levels do not permit growing of Deep Water Rice in the monsoon season.

Comment accepted.

6.333 Page A-3 : Table 1.1

1. Rice yields appear to have been given as paddy, not as rice (which is the convention in Bangladesh). This needs to be clarified.

   Even as paddy, HYV yields appear to be above national averages. This may be because the figures do not represent the average of good and bad years (as instructed in the GPA Agriculture annex, Step 5). Yields for other crops should also represent averages. Crops in column 1 below Local boro have been misaligned against data in the following two columns: i.e., b.aus should be against 20% in column 2, L. t.aman against 28%, aus/aman against 5%, etc.

2. Yield level of wheat, shown as 2.7 t./ha is too much on the high side.

Quoted yields are paddy. They are based on published figures. They are not, however, necessarily the yields assumed for project analysis. For example, present condition wheat yeilds are assumed to be 1.7 mt/ha (see Table 4.7, Vol. 13). The misalignment is noted.

6.334 Page A-3, Section 1.4

Irrigation development has taken place on all land types, but the first paragraph indicate that all irrigated land are in F2-F4 land types.

The paragraph is specifically discussing the impact in terms of cropping patterns of irrigation development on land which floods. It does not mean to indicate that irrigation development has occurred only on such land.

6.335 Page A-4 : Section 1.5

Fertilizer use data for Bangladesh has been presented. This report is mainly concerned with the North West region, so data for this region should be presented.

Comment accepted.

6.336 Page A-7 : Section and Table 3.1

Potential FCD area has been shown as 1.63 million hectares. It would appear from data presented in page A-3 that area under F2-F4 (requiring flood protection) is 0.3 million hectares only. F0 and F1 land types do not need any flood protection. How the Table 1.1 is related to table 3.1, needs classification.

The comment raises an interesting point, as to whether F0-F1 land types need flood protection. In "normal" years they do not, but in high flood years F0-F1 land is also vulnerable to flood damage. Therefore the question of the potential FCD area depends on the level of protection aimed for. However, it is perhaps a simplification to suggest that the whole floodplain area is potential FCD area, although the impacted area of FCD works is indeed a significant part of the floodplain.

6.337 Page A-8, 1st para

Availability of land by early November for seeding of HYV Wheat is very important.

Comment noted.

6.338 Page A-9 : 1st sentence under (b)

It has been stated that farmers switch from mixed aus-aman to t. Aman. Yield data presented in page A-3 show that yield of mixed aus-aman is 2.3 t/ha and that of t.aman is 1.3 t/ha. Why should farmer shift from 2.3 t/ha to 1.3 t/ha ? It is apparent that yield data need to be thoroughly investigated and corrected.

Comment accepted. The yields are incorrect because of the misalignment in the table noted above. It should be noted that the NW Region is not very important for mixed aus/aman and the discussion refers to FAP 12's national findings.

6.339 Page A-9, last three lines under (e)

The fact that fertilizer use efficiency in Bangladesh is very low need to be mentioned.

Comment accepted.

6.340 Page A-10, Last line

Crop residues should not be omitted from crop budget.

Crop residues are omitted in the economic analysis as a way of accounting for the assumed neutral effect of FCD on livestock. In farm budgets they would not be omitted.

6.341 Page A-13, 3rd para (e)

Use of DTW for transplanted Deep Water Rice would create confusion with Deep Tubewell. TDWR may be used uniformly throughout the report.

Comment accepted: elsewhere TDW has generally been used. This was a misprint.

6.342 Page A-13, Section 5.1.2

Rabi crops could increase in importance under three circumstances:

a) relative fall in rice prices, which would make irrigated boro cultivation less attractive on more permeable F0 and F1 soils;
b) growing urbanization within the region, increasing local demand for fruit, vegetables and spices;
c) construction of the Jamuna bridge, improving marketing possibilities for vegetables outside the region.

These factors may have an influence in the long term. However, it is felt that rabi crops will still be limited in production unless substantial heild improvements take place: there are as yet few signs of such improvements.

ANNEX. 1 : GAIBANDHA PROJECT

6.343 Page Ax-1, Section 3.1

Cropping pattern data should be presented by land type. It appears that if aman and HYV aman is grown on 84% of cultivated area. Yield level of crops, presented in page AX-2, do not indicate damage to crops. This immediately negates the need of any flood control measure in the project area. Expansion in HYV Boro area with irrigation extension appear to be a viable option without investing on flood control.

It is correct that there is already a high proportion of t. aman in the project, but the yield figures referred to are "normal" yields in the absence of crop damage. Crop damage is however quite substantial: the Gaibandha District as a whole suffers the greatest crop damage (on a per hectare basis) of the Greater Rangpur District, at least in high flood years. This damage is mostly to t. aman. It cannot therefore be concluded that there is no case for flood control in the area. What the analysis does show is that, in strictly economic terms, the project is marginal, but it has other social benefits and apparently few disbenefits.

6.344 Page AX-3, Section 4.1

1. It appears that if aman and HYV aman would be grown on 89% of cultivated area under future without project condition. This reconfirms the suggestion that there is no need of any investment on flood control in the Gaibandha Project.

The response is as above: the case for flood control is more to do with reductions in crop and non-crop damage than to do with changes in cropping patterns.

2. Why is HYV boro limited to 48% if, as stated elsewhere, irrigation is not a constraint ? The limitation needs to be explained. (Also, the list is not a cropping pattern. It would, in fact, have been useful to have shown crop allocations by F land types, also differentiating between permeable and impermeable soils).

This was responded to elsewhere (see para 7.188) - 48% is the anticipated level of irrigation at the time of full development (the relevant period for project analysis). Crop allocations by F land type have been included in the Final Report.

6.345 p AX-4, section 4.2, Table

Ditto.

6.346 Page AX-4, Section 4.2

1. Nothing has been said about pre-project and post-project area under different depth of flooding (land type) nor has the data been presented by land type. What is the basis of projecting 97% of cultivated area under L.t. aman and HYV aman under with project condition ?

2. Acreage under wheat has increased in this part. The soil and weather condition of the region is also favorable for wheat. Therefore, it is not understood why the wheat acreage is proposed to decrease with the project condition.

See response above: crops are now presented by land type. T. aman covers 88% of NCA in the revised analysis, and wheat acreage is unchanged.

6.347 Figure 1, following page AX-4

1. Flowering and maturity of the photosensitive aman varieties depend on day-length, implementation of the project has got nothing to do with it. Why should the harvesting of these crops advance with the implementation of the project ? Likewise Jute and B. Aus are timely fixed crop meaning that these matures in fixed number of days from seeding. Then why should growing period of jute increase and B.Aus decrease with the implementation of the project ?

2. Why should implementation of the project delay the plantation of HYV Boro ?

3. Wheat does not appear anywhere in the figure. If this is included with other rabi crops, future with project show the same in January which is too late for seeding wheat.

Most of the variations in the Figure referred to in the comments are between present and future conditions, not between without- and with-project conditions. There are relatively small changes between without- and with-project conditions.

APPENDIX 2 : CROP OF THE NORTHWEST REGION

6.348 Page A 2-1, Section 1.1

This is supposed to be for Bangladesh, why refer to the northern hemispher ?

Comment noted.

6.349 Page A 2-2, 1st para

It is stated that Aus rice is often destroyed or severely damaged. Yield data presented in page A-3 and the following paragraph do not support this statement.

The yield data referred to are "normal" yields, not taking crop damage into effect. Crop damage is dealt with separately and is discussed more in the Economics Volume, Vol. 13.

6.350 Page A 2-3, 1st para

It has been stated that seedlings of Deep Water Rice are 1 meter tall, why has then submergence tolerance limit suggested as 30 cm throughout the report ?

Comment accepted: however, the text refers specifically to transplanted deep water rice, whereas it is still more common to broadcast in the Region. For broadcast aman a lower submergence tolerance limit is appropriate (but perhaps more than 30 cm).

APPENDIX 4 : CROPPING PATTERN CALCULATIONS

6.351 Page A 4-1, Section 1

Tolerance limit for HYV and local varieties of rice should be brought down to 50 cm and 90 cm respectively as suggested by MPO. Field capacity level of soil moisture is needed for rabi crops, these would be damaged with 30 cm of standing water. Field capacity level of soil moisture is desirable for Jute, B. Aus and B. Aman at seeding

Comment noted.

Category 3 : Comments

6.352 p A-1, Section 1.1, para (b)

All rice varieties are susceptible to pollen sterility when night temperatures fall below ca20°. Local aman varieties can be transplanted later because they are photoperiod-sensitive which, before BR22 & 23, HYVs were not.

6.353 p A-1, bottom para, line 1

Change 'topographic' to 'physiographic'.

6.354 p A-2, para 3, line 4

In the MPO classification, both F3 and F4 land types are flooded deeper than 1.8m. F4 land differs from F3 land in staying wet for much or all of the dry season so that b.aman cannot be broadcast sown. (In the SRDI classification, the limit of 'very deeply flooded land' is 3m, not 3.6m).

(Last sentence): MPO's F4 land (and SRDI's 'very deeply flooded land') are often used for local boro paddy.

6.355 p A-2, para 4, line 2

After 'kinds' add 'of rice'.

6.356 p A-3, Table 1.1, F classes

There is no 'F5'

6.357 p A-6, para 5, line 1 (and elsewhere)

Change 'doncha' to 'dhaincha'

6.358 p A-7 : Last Para

The third sentence is too complex. This should be broken down so that the reader gets the message.

6.359 p A-9, under (e)

The 1st two sentences need clarification.

6.360 p A-11, 3rd line under (c)

Deep Water rice (DWR) should be used instead of floating rice.

6.361 Page A-12, (a)

Deep Water Rice seedlings can be and are actually transplanted in 50 cm of standing water.

6.362 p A-12, Section 4.3.2

Use MPO flood depth tolerance limits, except for transplanted DWA (not DTW).

6.363 p A-13, para 1(d)

While jute can withstand flooding, quality (and consequent price) is reduced. For this purpose, capsularis and olitorius varieties need to be differentiated: capsularis is more flood tolerant than olitorius; also, because it can be harvested earlier, capsularis can more easily be followed by t. aman than olitorius.

6.364 p A-14, para 2

Mustard-HYV boro is widely practised, even in wetter central and eastern parts of Bangladesh. A constraint on parts of the Teesta and Ganges floodplains is late drainage of lower-lying soils, which prevents mustard from being sown on time; on the Teesta floodplain, December harvesting of t. aman is a constraint on higher land.

6.365 p A-15, section 5.2,

Without irrigation para, (f) Cheena generally is grown as an early rabi crop, predominantly on charland.

6.366 p A-19, para 5, line 6

This statement seems to imply that the model cannot differentiate between F0 and F1 land. How, then, were allocations made for HYV and local aman ?

6.367 p AX-1

After Climate, add a new section describing flood depth classes.

6.368 p AX-1, Soils, second sentence

This statement may apply to the ridge soils, but almost certainly does not to the lower soils, most of which stay too wet, in a normal year, for wheat to be sown on time. Additionally, they retain sufficient moisture for aus and jute to be broadcast sown in the second half of February, without waiting for pre-monsoon rainfall. Capsularis jute (which can be sown earlier than olitorius) is sown on such land. This means that both jute and aus can be harvested well in time for t.aman to be planted.

6.369 p AX-2, section 3.1, line 1

State year of BBS statistics. The data given list crops grown, not cropping patterns.

6.370 p AX-2, crop yields table

See category 2 comments on Page A-3 above.

6.371 p AX-2, section 3.2 (d)

Transplanting of DWA is traditional in basin depressions in Gaibandha (as reported in the Kurigram-Gaibandha reconnaissance soil survey report in 1970), but it is included with t. aman in the crop statistics.

6.372 p AX-3, section 3.2.2 (b)

Boro would not displace wheat on permeable ridge soils.

6.373 Ditto, 3.2.2 (d)

Growing urbanization expected within the planning time-frame could increase demand for fruit, vegetables and spices.

6.374 p AX-5, line 3

See Category 3 comments on Page A-13 and AX-1 Soils.

6.375 p A1-1, para 5, last line

If the K-B floodplain had 'received silt deposits from the Brahmaputra' it would have been part of the Jamuna floodplain, as on the Jamuna left bank. The K-B floodplain has Teesta deposits laid down

on the Karatoya and Bangali floodplains, mainly before the Jamuna invaded the region.

6.376 Figure 2, Legend

Correct spellings of Bangali, Purnabhaba and Brahmaputra. (Also correct purnabhaba elsewhere on maps and in text).

6.377 p A1-3, para 2

Farmers also give priority to aus on this floodplain because of more permeable soils and the greater risk of late floods affecting aman transplanting.

6.378 Ditto, para 3

Omit last sentence: both parts are incorrect.

6.379 p A2-1, section 1.2, last para

Yields should be given as milled rice, and it should be clarified whether they are present average or potential yields. (Also for other corps described later).

6.380 p A2-1, section 1.3 heading

Omit 'or Spring rice'. This is confusing: in Bangladesh, aus is considered autumn rice, by reference to the time of harvesting, (not, as in Europe, to the time of sowing).

6.381 Ditto, para 1, line 4

The caveat is inappropriate: both boro (with irrigation) and aus (rainfed) are widely grown in the NW region on F0 and F1 land where early flooding is not a constraint.

6.382 p A2-3, Jute

a) para 1: Corchorus.
b) para 2: Jute sticks are used also for house walls and fences.
c) para 3: capsularis and litorius have different sowing and harvesting dates, and different flood depth tolerances, Flooding affects fibre quality.

6.383 P A2-4, para 1 (c)

It is not flooding that destroys irrigation channels so much as ploughing them over to use the land for kharif crops.

6.384 p A2-4, sction 4.1

Cheena is grown mainly on charland in the early rabi season.

6.385 p A2-5, para 1

'Vetches' is khesari, Groundnuts are used as a popular snack food, not as a luxury.

6.386 p A2-5, section 5.2, para 1

Safflower is kusum. Tishi is linseed.

6.387 p A2-6, Sesbania

Dhaincha (or dhainchya), not 'doncha'

6.388 p A3-2, bottom table

a) There are big differences in yields from those given in Table 1.1 (page A-3).

b) Clarify whether rice yields are as paddy or as milled rice; the latter convention is followed in Bangladesh.

c) Although 'floating rice' is the agreed IRRI term for rice varieties that can grown in > 1m of water, it is better to follow accepted Bangladeshi usage and refer to deepwater aman (either b. aman or t. DWA).

6.389 p A3-3, bottom para

Demographic pressure should ensure gross labour availability. Farmers, especially small farmers and tenants, often lack the resources to employ labour in the numbers required for speedy harvesting.

6.390 p A3-5, bottom para, line 1

Add 'per day' after first 'bigha'. Change subsequent 'bhiga' to 'bigha' (3 times).

6.391 p A3-7, section 2.5.1

Note that transplanting requires much less seed than broadcast sowing.

6.392 p A4-1 and 2

See general comment above on crop depth tolerances.

6.393 p A4-2, bottom para

Clarify whether the allowance made for homesteads, etc., is to cater for the expected increase in population or some other reason. If the former, given the percentage population change and the pro rata population increase/cultivated land loss assumed.

VOLUME 12 - FISHERIES

Category 1

6.394 The sequence in the objectives, as laid down in the TOR, with Culture Fisheries preceding Capture Fisheries, should be followed, and this is usually followed by everybody.

In the TOR from F1 to F4, headings and subheadings etc. have been indicated. Many of the aspects, for instance, Capture Fisheries, Culture Fisheries etc. have not been divided as such. Capture Fisheries for example, could be divided into captions viz. location, identification and quantification; Current status and potential; FCD/FCDI impacts on different components. FCD/I impacts on the Fishing Community; Perceived development constraints etc.

Impacts of FCD/FCDI projects have not been discussed separately for the different components of the two major types of fisheries, as required in the TOR.

Comments concerning report presentation with, for example, culture fisheries preceding capture fisheries, are noted. However, it was considered that the capture fisheries had to be given prior consideration and emphasis because of their especial importance to most of the rural population. The damage already inflicted on fish stock sustainability by past and ongoing FCD developments and the vulnerability of these already diminished capture fisheries to overfishing and to adverse impacts from future flood control measures strengthens the argument for capture fishing to be treated as the key issue.

Although the presentation may differ from that suggested in the TOR, it is considered that these matters have been adequately discussed in the context of the regional plan.

The impacts of FCD/FCDI projects on the two major types of fisheries, namely capture and culture fisheries, are discussed in the report, notably in section 3.1, based on the findings of FAP2 field work and on FAP12 case studies in NWR (Chalan Beel Polder D, Kurigram, BRE, Nagor River and Protappur Project Evaluations).

6.395 Mitigation of Fishery Impacts: The report could have come out with more fish culture investment packages attached to the FCD interventions which would more likely improved the IRR of the total programme. Require a fishery development plan for each intervention. Certainly at the time of pre-feasibility or feasibility the mitigation plans with costs need to be incorporated in the plan.

Programmes are to be designed to really try to achieve an equitable distribution of the post project fish harvest. To do this the projects are to invest in a fish mitigation exercise which concentrates project resources on the original beneficiaries of the floodplain.

The regional planning study identified the nature and range of mitigatory measures considered appropriate. In the case of the Gaibandha pre-feasibility study (Annex 1), these measures were located, quantified and costed, following consultation with DOF staff and others, as shown on pages FX8 to FX12. It is anticipated that follow-up feasibility investigations in the other NWR project areas will include similar detailed consideration of mitigatory fisheries sector initiatives.

Over and above the mitigatory measures needed within NWR, the FAP2 study identified the need for

coordinated programmes at inter-regional and national levels, in order to halt and reverse the ongoing decline in capture fish stocks and production. This work has to be tackled as a matter of urgency otherwise in the relatively near future there will be no post-porrect fish harvest to distribute.

Category - 2

6.396 p F1 - Introduction

The richness of the NWR's fisheries resources with some indication on the fish production, its contribution to the national fish harvest, employment and economy local fish demand and requirement etc. should have been included in the discussion here.

6.397 p F2, para 2

Many interviews have been referred to; but how about interviews with the Fisheries Scientists of the Rajshahi University and the appropriate authorities of the BWDB projects (Kurigram South for instance)?

6.398 p F/3, Section 2.1

Quantifications of the riverine and the flood plain components of the capture fisheries have not been authenticated by quoting the sources of information.

6.399 p F2, last para

How has the information been gathered on the fish stocks?

6.400 p F3, 1st para

What is the source of information on the fish fauna?

6.401 p F3, last para

The FAP #2 is a project of 2 (two) years duration commencing from the lst of January 1991 and ending on the 31st December, 1992. So we fail to understand why 1988/89 is the most recent year for which data are available. On going through the Inception Report (March, 1991), a questionnaire survey was suggested with the necessary questions to be asked, and again on receipt of the Interim Report, the necessity of the current data was greatly emphasized but to no effect. No development plan can be conceived on such outdated data and on those collected from secondary sources.

6.402 p F7, last para

Again we wonder why no current data on the fishing community are available. It takes hardly two weeks time or a month at best, to collect comprehensive data on any of the fishery aspects if there is any intention or urge to do it. Fishing Community Survey in other words, catch assessment survey is of utmost importance in ascertaining the FCD/FCDI impacts on fisheries production. The present project does not provide the existing situation which is one of the primary objectives of the study.

6.403 p F7, last para

How was the 50% figure for full-time fishermen seeking other employer derived? Where are the results from the fields investigations?

6.404 p F8, Section 2.2 - Culture Fisheries

Updated data on the number, area, current status, unit production etc. of Pond Fisheries are missing. No attempt was made at collecting such current information. In view of the facts stated above as to the primary data, undertaking a long term project like this, can hardly be justified. Why to blame DOF? Current data on different aspects of pond fisheries could be easily collected. A statement "all that can be said now is that there were about 41400 ponds in NWR in 1983/84 etc." is unexpected and undesirable.

6.405 p F10

The culturable and derelict classifications do not always hold up in many locations. For example many of the derelict ponds could produce sizeable quantities of fish with a small amount of investment/improvements.

6.406 p F11, para 1

If the FCD project works properly then there should be an incentive to invest. Agree that investment funds must be made available through the project along with a technical assistance package.

6.407 p F13, para 1

It is unlikely that at least in the near future regulations imposed will be followed by fisherman on the spawn catching grounds. The better way is to encourage the private sector in production and provide alternative forms of earning an income for the spawn collectors.

6.408 p F14, para 2

Agree that the DOF will have difficulty taking on additional activities, and recommend that intervention be financed and conducted by the projects themselves.

6.409 p F14, para 3

The SPARRSO data for the ponds and beels was not in fact determined by a survey but from aerial photos and some ground truthing.

6.410 p F15, para 3

The average annual per capita availability of fish in the region could be indicated. The reasons for the low productivity should have been outlined and listed under both culture and capture fisheries.

6.411 Section 3.1 - Impacts of FCD/FCDI

The two main areas of impact relate to pond culture which is often facilitated by the FCD/I project and capture fisheries which is often devastated. The former impact tends to benefit a small group of privileged individuals while the latter impact affects large number of poor and landless fishermen. These impacts have been discussed but in general terms and are not based on specific data. There is a need for a much more factual information. Required mitigation measures cannot be planned and costed on the basis of the vague or general information.

FAP #12 case studies have been just referred to, but not specified. FAP #12 evaluated the main impacts of a total of 17 completed FCD/I projects in Bangladesh including 5 that were assessed by application of Project Impact Evaluation (PIE) methods. How many and which of the NWR projects have been evaluated and by which methods (PIE or RRA)?

6.412 p F16, Section 3.1 (d)

There has been an indication of lower catch rates which would imply lower per capita income. These impacts have not been quantified.

6.413 p F17/F18, Section 3.2

For any kind of development strategy, the problems are to be identified well. What are those specific problems for the NWR? How about reduction in dry season water levels of major and minor river? What about impacts on the number of the permanent beels? How about the permanent beels? How about the impact of irrigational abstraction of surface water on different species of fish and shrimp.

A good number of development strategies have been suggested but vary few of them are concrete proposals. The strategies are: Rigorous enforcement of existing legislation, introduction of additional conservation measures,further research into the design of sluices etc., restricting irrigation water extraction,expansion of private sector hatchery programmes, developing hatchery technologies, strengthening extension programmes and provision of a source of credit etc. How to implement these and who will bear the costs? The economics/cost effectiveness has to be worked out.

6.414 p F19, Section 3.4.1 - Mitigation

Its a good idea provided construction of rearing and nursery ponds (improvement of beels) should come from the Government owned lands. The beels with proper embankments (poldered) could also be used as nurseries.

6.415 p F20, last para

Need to have an economic evaluation for the fish pond development activities.

6.416 p F20, 1st para, Section 3.4.2

Its also a good idea but there must be a per/ha budget analysis.

6.417 p F20, Section 3.4.3 - Modified FCD Structures

The consultant Team (CT) should come up with clear idea on such modification. Referring to ones proposed by FAP #3.1, #13 etc. or waiting for the FAP #17's trial would not serve the purpose. Various types of fish trial would not serve the purpose. Various types of fish friendly structures have now been known. The ones consisting of fish ladders or of troughs would not work in Bangladesh as the major carp are not leapers. Those of by pass-channels may not be compatible with FC/FCD/FCDI projects. How about the Key Lock Type. Could the CT come up with a design on this?

6.418 Section 3.4.5 - Fish Pond Development

The UNDP and FAO have been co-financing a 4-year project aiming at improving the management capability of the DOF through a project entitled "Institutional Strengthening of the DOF". It also provides support for pond and freshwater shrimp culture through use of the demonstration farms and training. So the approach that might be followed is the one used in the Mymensingh Aquaculture Extension Project where temporary project staff work together with the DOF and the local pond owners in the development of hatcheries, nurseries and pond development. Fishermen Cooperatives may be formed and ponds leased to these cooperatives with provision for NGO assistance of free fingerling supply along with technical assistance as in the case of Noakhali Integrated Rural Development Project (DANIDA).

An estimate of potential pond production indicating the future situations with and without FCD/FCDI projects in regard to the number of fry, fingerlings, harvestable fish, weight of harvestable fish, pond area and yield (ton/ha) should be provided.

6.419 Section 4.3

Not much difference is found in the Caption here and in that under section 3.4 (one being possible mitigation and the other mitigation proposals).

In the earlier comments on the Interim Report in November 1991 mitigation measures such as trading off, in favour of fisheries production by allocation of land, intermittent opening of regulators and water control structures at desired times (monsoon), fisheries appraisal and analyses early in the project planning stage (Borrow pit Fisheries development and so on) etc. were suggested.

6.420 p F21, para 3

DOF will have difficulty in implementing more new activities, it should be designed into the cost of each of the projects with the DOF in a supporting role.

6.421 p F-23, para 1

The pond data may require updating in the future based on actual field studies. Believe that the pond data may be off. "On spot" data collection from the Upazilas is not always accurate.

VOLUME 13 - ECONOMICS

General Comments:

6.422 Estimation of Non-Crop Damage Reduction Benefits

Since non-crop damage reduction benefits account for about a third of the total benefits, their estimation is very important. However, the methodology used to derive the damage - frequency curves appears to be rather sketchy and needs further elaboration.

(a) The derived relationship between crop-damage and non-crop damage (if there is any) is most likely to be nonlinear rather than the one presented in figure 4.1 (a linear one), also, assuming that a linear relationship exist whether the estimated coefficients are statistically significant or not has not been reported nor, the fit and the significance of the regression equation in the form of R^2 and F. Further, the above questionable relationship was used to derive non-crop damage data for the years 1971-84 in order to obtain a data series for non-crop data for 1971-84 in order to obtain a data series for non-crop data for 1971-88. One would wonder whether such generated data would be close to reality, in particular, the high flood years before 1985. For the reasons just stated, applying the same weights for the non-crop damage for desegregation to thana/project level may not be legitimate.

(b) The consultants could have used a different approach, Instead of using a relationship between crop and non-crop damage for derivation of the flood frequency curves, they could approach this first by establishing a relationship between flood return period and area inundated (Gumbel probability, etc.), for each district and then by establishing a non-linear relationship between non-flood damage and area inundated and thereby estimate mathematical expectation of annual non-crop flood damages for districts a-la-the French consortium study. They could then use suitable assumption to desegregate non-crop damage data to thana/project levels.

(c) Consultants are requested to i) elaborate the procedure ii) specify all the exact relationships with statistical significance used for estimation of non-crop damage and iii) provide estimation of non-flood damage as identified in (b) above and thereby provide and alternative estimate of the average annual flood damage for the districts.

The difficulties of assessing non-crop flood damage are readily acknowledged, particularly in view of the likely unreliability of the data. However our approach, which is fully elaborated in the text, allows a reasonable estimate to be made of non-crop damage at the thana level.

The assumption of a linear relationship is in fact fairly logical. The data on non-crop damage show that, in terms of value, damage to infrastructure such as embankments, and to rural dwellings, are particularly significant. One would expect that, as flood embankments were damaged, so therse would be an increase in crop damage. There is not an exact linear relationship, but the parameters of the regression equation show a reasonable fit. These are as follows: $R^2=0.75$, $r=0.87$. The coefficient of the independent variable is 1.19 with a standard error of 0.162 and T value 7.36. Fratio=54. D-W test=1.86. All these parameters demontrate that the relationship is statistically significant and is acceptable as as a basis for the subsequent analysis.

The main problem with the proposed approach in (b) is that it is not possible to fit a Gumbel distribution accurately to only 4 years' data. The consultants did considers such an approach but decided it was not appropriate because of the data problems. One would have to question the

accuracy of the French consortium study results in this regard. Therefore, while it is acknowledged that the estimates of average annual flood damage are only approximations, the consultants believe that, given the shortage of data, any alternative approach would not give results which could be treated with any more confidence. Furthermore, the estimates obtained non-crop damage seen, in the consultant's judgement to be of a reasonable order of magnitude.

Category 1 : Comments

6.423 Presentation of statistics and references.

The annex provides no assessment of the accuracy of the secondary data used. The quality of official statistics is known to be highly variable and the implications of this for the analyses presented should be indicated. Sources of data used should be given.

When annual growth estimates (e.g., p5) are presented, it should be made clear whether the figures are trend rates of growth or not. Trend lines are not presented in the report and statistical analyses of differences in trends are not given.

Comparisons in cropping patterns over time should not be done by taking two single years (e.g. 1970/71 and 1983/84 on P5) since year-to-year variation is so great. The usual approach in Bangladesh is to compare averages for 3 years (e.g. average of 1968/69 to 1970/71 with average of 1982/83 to 1984/85).

When references are given (e.g., Hossain and Gisslequest on p5), the consultant should give the full reference, including publishers etc.

The points are noted. The discussion, on p5 is basically a descriptive summary from the sources cited in the text, it is not meant to be a rigorous statistical analysis.

6.424 P-2, Points 4

The analysis has been carried out in 1991/92 and not in 1990/91 prices as suggested int he GPA. Failure to do so would tend to hamper comparability with other FAP studies since 1991/92 price-cost configuration may be quite different from that of 1990/91.

See earlier responses on this point. If the 1991/92 price-cost configuration differs markedly from that of 1990/91, it is surely better to use 1991/92 prices since otherwise all projects might be wrongly appraised.

6.425 P-6, Para 1

The view that there has been no increase in the average yields of HYVs is counter-intuitive since, otherwise, why would farmers shift from one variety to another (e.g. BR4 to BR11 in aman; IR8 to BR3 in boro). New varieties for all seasons are in the pipeline at BRRI.

The view expressed in the text is based on and supported by BBS statistics.

6.426 P-6, Para 3

The consultant should be more thorough here. Yes, at present, there is no doubt that the greatest scope for increasing production comes from minor irrigation and HYVs. But when will irrigation approach full development (this should be given from NWP estimates in para 2) and what will be the potential of FC and D thereafter in increasing food production?

Full discussion of irrigation potential can be found in Vol. 10. The points made by the consultants appear to be relevant at least in the medium term.

6.427 P-7, Section 2.2

The estimation of real prices of paddy and wheat is not correct since the GDP deflator has been used, which includes as a main component the price of cereals. Also, a time series of 7 years is not sufficient to talk about trends. Why was a longer series not used? The consultant should also comment on likely income elasticities of demand for different outputs (e.g., rice, vegetables, fish) and the implications these might have for future patterns of demand (see, e.g. Bangladesh Planning Commission (1989) Food Strategies in Bangladesh - Medium and Long Term Perspectives', especially chapters by Asaduzzaman and Hosain).

The point on real prices is noted. If a deflator was used which omitted cereals, there would be an even bigger decline in real prices than is indicated. The consultant believes that 7 years data can indicate a trend. Other points are noted.

6.428 P-8, last para

This description of farmers' rationale (i.e., that farmers plant in the expectation of serious flood damage 1 year in 5) is interesting, but needs to be further explained and justified with field data, where possible.

It is an assumption which appears reasonable and which is to some extent borne out by the correspondence between model predicted cropping patterns and actual cropping patterns (described in Vol. 9. Ch. 6).

6.429 P-9, Para 4

The consultant should follow the approach to valuation of fisheries impacts given in the GPA. There may well be reasons for valuing fish impacts more highly, but this should be done by carrying out sensitivity analyses, not by arbitrarily assuming a 44% increase (125/87). The GPA must be followed in order to allow comparability with other studies and the consultants should use the SCF and do sensitivity analyses with prices 24%, 50%, 75% and 100% higher to compensate for likely shifts is market prices over time, a "scarcity premium" and possible underestimation of losses, if these seem reasonable.

The consultants' reasons for applying a scarcity premium to the price of fish were given earlier.

6.430 P-9, Para 5

Although NPVR is the correct ranking criterion when budgetary resources availability serve as the constraining factor to water resources development, ranking of alternative option by NPV should be done as well.

This will be done but is not strictly correct.

6.431 P-9, last para

A key project cost should be "mitigation costs".

Project analysis attempted to quantity benefits and disbenefits as accurately as possible. Mitigation measures should be planned and analysed separately.

6.432 P-10, Para 1

"Crop intensification benefits" is not very clear, assuming that it is meant to cover (as stated lower down the page) benefits due to agricultural intensification and shifts to higher value crops.

No response.

6.433 P-14, para 3; Table 4.4; P-16(a)

Is this a realistic assumption? Isn't some increase in the boro area likely as a result of drainage alone?

This was discussed earlier - there may be some increase in boro area but it is felt that it will be small.

6.434 P-15, Para A

Is this the only change between [P] and [W] which it is reasonable to assume? What about intensification which does not require irrigation (the history of agricultural intensification in Bengal is one of a continuing intensification of production over the last 50+ years). Also, reference should be made here to the independent yield increases assumed by the consultants (p17, para 5).

It is not clear what other changes might occur, therefore the consultants chose only to include obvious changes.

6.435 P-15, Para (i) to (iii)

This section argues that there is less potential for HYV aman - the main source of FCD benefits - than might be supposed. However, the argument put forward in (i) is contradicted by data presented elsewhere in the report. Local t. aman production is 40% higher than HYV aman and area is 70% higher. It is thus not true to say that "HYV t. aman is already about as important as local t.aman" - it has a long way to go. Point (ii) should be explained. Point (iii) is not sound since, even if this is the case, the area flooded to the depth and for the period which new HYVs can tolerate would still increase with FCD.

The comment is noted. Point (1) was based on BBS data for the project areas and planning units identified by the consultants, which did indeed suggest that areas of HYV aman were about equal to

l.t. aman. However, at regional level this is not yet the case. Point (ii) means that one constraint to growing HYV aman is the absence of irrigation, which prevents a boro-HYV aman cropping pattern from being adopted, i.e. the constraint in this case is irrigation, not flood control (or lack of it). Point (iii) is relevant in that it may reduce the area over which FCD results in substitution of HYV t. aman for l.t. amna, as distinct from substitutions.

6.436 P-19, Para 4

The consultants should do the analysis with the economic prices from the GPA and do a sensitivity analysis to show what the impact of reductions in fertilizer subsidies. It may be that the change in subsidies is short-lived - the last 10 years has seen considerable year-to-year fluctuation in fertilizer subsidies.

This point was responded to earlier.

6.437 P-20, Section 4.3.2

Crop damage should bealt with in the estimation of yields (see GPA, Annex 1, p-2-3). If it is not possible, easily for the consultant to do this, the report should make it clear (which it is not at present) what assumptions were made in estimating the "without crop damage yields". Were changes in the value of crops over time (due to intensification of production) taken into account in estimating the crop damage frequency curve?

It was already stated that the yields used in analysis are "normal" yields, and estimates of crop damage are derived separately. Since crop damage estimates were based on historical data, changes in value of crops due to intensification were not taken into account. It is also not clear how that could be done.

6.438 P-25, Para 3- Other Socio-economic Effects

This is again couched in rather negative terms. In line with the GPA, the consultant should list all those other impacts which will be taken into account in the MCA and indicate, for severe adverse effects, the possible means of mitigation and costs associated with such measures. Would it be possible for these to be taken into account indicatively by including incremental construction and O&M costs for such mitigation in the analyses? For the Gaibandha Feasibility study, some attempt should be made to estimate the impact on farm-gate prices of changes in rural transport resulting from FCD (building on the analysis presented on p-51-53).

Data limitations prevented further analysis of these additional effects. It is the consultants' judgement that farm-gate prices would exercise little or no change due to the change in rural transport, but the data do not allow such an analysis.

6.449 P-34, Para (i)

In view of the sensitivity to forecast levels of agricultural benefits, further sensitivities on the values of key variables (e.g. rice prices, shadow wage rate) would be carried out.

Noted. This is done in the Final Report.

6.450 P-42, Section 3

For a feasibility study, the economic analysis should be based on farm survey data collected in the project area. The survey carried out in the 6 villages produced useful data, but would need to be extended and the generalisability of findings tested through rapid rural appraisals.

It is intended to further analyse the survey results.

6.451 P-46, Land Acquisition

Again, in a feasibility study far greater detail would be expected. Who owns the 713 ha of land that needs to be acquired for the Gaibandha project? How much resettlement will be needed? At what cost? How would the land acquisition and resettlement process be planned and implemented?

These details are better dealt with in the detailed design stage.

6.452 P-48, Para 3

Similarly, far greater information needed in a feasibility study on how the project would be targeted to the needs of the rural poor, especially poor women. this is not covered in sufficient detail in volume 11 and should, in any case be costed and included in the economic analysis.

Again, details of implementation and inclusion of target groups should be carried out in the detailed design stage. The core costs of the project, which assumes manual construction (for example by LCS, including women) are of course included in the economic analysis.

6.453 P-53, Section 5

The income distribution analysis is also inadequate for a feasibility study. It should be based on a larger sample (see comment on P-42 para 3, above) and should include consideration of the use of common property resources by the rural poor (estimated in some studies to be equivalent to about 15% of landless incomes and of impacts on particular professional corps e.g. professional fishing households).

Further income distribution analysis has been carried out on the survey villages for the Final Report.

In the sensitivity analysis, the import parity price suggested by GPA should be 1.11 and not 1.02 as used in the analysis.

In the multicriteria analysis the range of ordinal ranking suggested is GPA is ± 5 and ± 2 used in the exercise.

Noted.

Category 2 : Comments

6.454 P-5, Para 5

The argument would be clearer if production figures were given. This would show that aman production has grown little.

The comment is noted but no fully agreed. BBS data (given in Md. Abdul Hamid, A Data Base on Agriculture and Foodgains in Bangladesh), indicates total aman production for the region of 2.09 mm mt in 1974-75, 2.54 mm mt in 1986-87, and an estimated 3.07 mm mt in 1989-90. The jump in production in the later period is significant.

6.455 Figures 2.1 to 2.34

This extensive series of graphs could be reduced down to a few key graphs summarizing the main points made on p-6 (1 to v). There are a number of figs on which titles or axis labels are not clear (e.g., Fig. 2.1 - Bangladesh or NW?). It would be helpful to include aus and T. aman in the graphs of area and production of rice "types". Also trends in yields should be presented. Unusual aspects of the data (e.g., low HYV aman production in 1988 on Fig. 2.6; the increase in L. Boro shown in Fig. 2.12) should be commented on and explained.

The comment is noted. Low HYV aman production in 1988 is probably related to flood damage. The steady increase shown in l. boro appears to be an error, although the data source quoted above (Hamid), shows some increase from 1984-85 to 1987-88, but a sharp decline thereafter.

6.456 P-7, Para 5

This is somewhat negatively couched and would seem to contradict the methodology used by the consultant.

The consultants are stating the views of other studies and organisations, but have attempted to analyse FCD in an objective manner.

6.457 Table 2.2

Again a methodological problem here due to the fact that the deflator used (the consumer price index for rural families) is a general indicator which does not reflect the "basket of purchases" of the poor. A better index would be the HYV Boro price of rice since foodgrains make up over 60% of the expenditure of poor households (e.g., from table 2.1). If this is used, the results are somewhat different and indicate an upturn in real wages in 1990-1 and 1991-2.

It is possible to use a number of indices, but the consultants cannot agree that the HYV boro price of rice is a "better" index. Why is it better? The rural CPI is more representative of the consumption basket of the poor than an index totally based on one rice variety, and even that rice variety is not necessarily the one that poor people consume most, since they tend to consume coarse varieties.

6.458 P-8, Para 3

Need to specify clearly what is meant by "impacted area'. Does this include all upstream and downstream and downstream areas impacted by a given project?

Yes.

6.459 P-12, Para (i)

Make it clear how "typical" 1989 was, following as it did the floods of 1988.

It is difficult to find a "typical" year without going back too far. 1989 was chosen because it was the latest year for which data were available, and as such should be more representative than earlier years.

6.460 Table 4.7

Are these data per ha? It is surprising that Local B. Aus has a higher labour requirement than local transplanted aman. This should be explained.

Yes, data per ha. Local aus needs a lot of labour for weeding (usually in the slach season, therefore at reduced wages), and this is the main cause of the fairly high labour requirement.

6.461 Table 4.8

Labour requirements for HYV boro would be expected to go up given the 16% autonomous increase in yield assumed (+1% year for 15 years).

Point noted.

6.462 P-18, Last two para

It is surprising that the consultants appear not to have field checked farm gate prices, since labour and draught power costs were checked. the uniformity of farm gate prices across the region should be checked with the findings of other surveys (e.g., those of Crow and Murshid - an ODA supported study and IFPRI). Again, the use of a general GDP deflator would seem problematic.

The consultants collected price data but were satisfied that the data collected by the D.A.M. were comprehensive and should be used. No such data exist on labour and draught power (i.e. not at that detail) and therefore the consultants collected more data on these inputs.

6.463 Table 4.9

There are small differences between the economic prices from the GPA and those in this table (e.g., the conversion factor for the Pump House and base is given as 0.87, whereas GPA gives concrete as 0.79 and labour as 0.65). Similarly, pumps, screens and reducers should have a CF of 0.62 not 0.61).

Comment noted.

6.464 P-22, Para 1

Borrowpit fisheries can support either capture or culture fisheries. On pond fisheries, what assumptions have been made about possible. increases in the area of ponds (by converting agricultural land to ponds) as a result of the decrease in flooding.

In general it has been assumed that pond productivity will increase since overtopping will be reudced. It has not been assumed that new ponds will be developed. See Vol.12 for further detail.

6.465 Table 4.17

The unit production costs of capture and culture fisheries and labour requirements. What assumptions were made about returns to capture fishing?

Details are given in the footnotes.

6.466 P-23, para 6

Is not any FC development going to add to increase discharges downstream? The question is whether these are sufficient to adversely affect people there. With reference to the last para, how these impacts have been internalised in the planning area approach or by planning area definition for Gaibandha should be described.

The text explains how impacts have been internalised.

6.467 Figure 5.1

This seems a bit too good to be true - perfect fits of each and every graph?

These are trend lines: the points are derived when the best fit line is fitted.

Category 3 : Comments

6.468 P-1, Para 2

"extent" rather than "degree" of water resource development.

6.469 P-2, Point 11

The GPA give two unskilled shadow wage rates for construction and agriculture. If these were not used, they should be. If they were used, the two prices should be given here.

6.470 P-4, last para

Make clear whether this refers to Bangladesh the NW region. Has the limit to wheat production been reached? Wheat could be grown over much of Bangladesh, But is not because the farmers get a higher return to rice production.

It is Bangladesh being referred to. Points on wheat noted.

6.471 P-8, Para 5

Where was the reason for including the NPVR(1) explained? This explanation should be included in this annex.

The reason is given on P3.

6.472 P-10, para 5

Mention the wide range of conflicts that can result in public cuts, not just the problem of "outsiders".

Conflicts reading to public cuts are addversed more in Vol.11

6.473 P-13, Para (i)

Any need to mention LLP here? - even if there was substitution of STW for LLP later.

Noted.

6.474 P-18, Para 2

Why STW are better suited to Bangladesh's agrarian structure should be explained.

The reason - case of water management (linked to issues such as scale of operation, land fragmentation etc.) as well as relatively low investment cost - is mentione din the text.

VOLUME 14 - ECOLOGY

6.475 Category 1 : Comments

The experts prepared the report from the consultant's side have an impression that the readers are so naive that they should have the first lessons on basic chemistry and biology. But it should be clear to them that they are obliged to produce a meaningful report to be used profitably for the project. What is the use of detailing low entropy energy and matter (matters once used and becomes high entropy are still being recycled in Bangladesh for the shear scarcity), how ecosystem (living and dead organisms interacting with one another and their non-living environment - energy and chemicals) works (flow of high quality energy from sum through materials and living things), how tiny fraction of solar energy is captured by green plants and used in the process of photosynthesis to make organic compounds, organisms need to survive, how the biological community of a ecosystem and their environment of chemical and physical factors interact in a dynamic system that sustain the community, how terrestrial and aquatic ecosystem differ, how and why biotic components of ecosystem have been classified as producers, consumers and decomposers, what is range of tolerance and law of limiting factor principle, what is the food chain, tropic level and food web, ecological niche (specialist and Generalist) inter specific competition, predation, parasitism, synergistic effect, population dynamics, ecosystem's carrying capacity, natural selection, biological evaluation, speciation and extraction, biological diversity and Ecological Succession. For heaven's sake such text book lectures are not desirable. Such general discussions make no difference whether it is for FAP 3 or 2 or 6. These basic understandings of their interactions, interlinkages and overlays hold good unless special mentions are made for specific area with possible quantification or at least indications.

We all know that ecologically sensitive areas are being constantly plundered by increased population, ecological resources are being constantly depleted but without concrete suggestions as to what should be done to overcome the situation, what is the point of elaborating these known facts in a 100 page or so fat report. Lot of data have been collected and collated but these information standing alone means nothing. How and why these data are important, what are these linkages, that might happen if a component is completely withdrawn from the linkage and how to avoid such a situation are some facts those need elaboration.

Category 2 : Comments

Under nutrient availability - Nitrogen fixation 1.3.3 page 1.-3 - the contribution of this natural source appears absolutely fascinating (35-50 kg/ha). I would have loved a reference to be quoted. During flood Jamuna remains so turbid that such a possibility appears to me to be unrealistic. To avoid fast leaching chemical fertilizer in pellet form are becoming increasingly popular as it releases nutrient slowly. It is very well known that uptake of chemical fertilizer is only between 35-40% and the efficiency of uptake needs lot of improvement.

6.476 Section 1.3.6, Nitrogen harvesting

For centuries farmers had been planting leguminous plants in between cereal crops to fix nitrogen free. Research work are under way by using bio-technology so that gene transplation can enable cereal crop fix nitrogen (though uptodate success in minimal) or use more solar energy and covert it to food though high efficiency photosynthesis).

6.477 p 1-4, Section 1.4.2, Highland habitat:

It would have been a good idea to give some impression of the interlinkages of the said habitat and how the different life forms are interacting and the different beneficial insects in the project area helpful as biological control.

6.478 p 1-5, Section 1.4.5, Beels:

Very well understood problem and FAP projects do try and incorporate these mechanism. But mare statement and no indication as to the present status, future probable scenario and proposed mitigation makes the write up less credible.

6.479 p 1-6 ,Section 1.5 Energetics of fish stock (P 1-6)

High fish diversity to my feeling (no reference quoted) is probably not due to specialized niche (400 different species in the country and more than hundred in the project area) but the enormous fish feed available in the flood plains (1.5 million tons of dry weight fish feed) and a well balanced food chain. Some idea or quantification would have been welcome.

6.480 p 2.1 3rd para

"This study revealed that there is a fundamental conflict of interests between the development of agriculture in Bangladesh and the management of flood plain fisheries." Agriculture here I think means cereal crop production. It is nothing new. This conflict is well known to Bangladesh planners.

Last but one para : No doubt that the survival strategy of poverty poor in rural Bangladesh are yet not fully under stood and some insight into it would have been a welcome effort.

The consultants are extremely eager to undertake fundamental research in Ecological field as that of FAP 16 team. Regional studies are expected to give an available resource picture and how well they may be managed to meet the future needs of growing population based on available data and information.

6.481 P 2-2, Functional Ecology

Last line - We do appreciate that past engineering solutions were not sympathetic enough to take into account the sociological and environmental components and as such desired benefits were not realized. Such studies are benefits were not realized. Such studies are aimed at arriving at such an understanding. Discussing various component of ecology (should have been environment) in isolation do not really help over come the difficulties experienced in the past. Based on secondary data (and RRA type of field data as claimed by the consultants) such directions were expected.

No doubt energy transfer between aquatic and terrestrial ecosystem is extremely important and fundamental and that is the reason FAP interventions need to be taken with cautions. But have the consultants gave a passionate thought as to why such a change has taken place. Do they believe that

all the past development planners were anti-people. They were out to destroy the basic life support system. The hard fact of rapid population explosion turned the ideal (or at least much better compared to now) situation to an environmental might mare (what else the planners could do may kindly be specified). As least they kept the growing population feeding within the limited resources and technology.

It is gratifying that the consultants are honestly perturbed at the rate and extent of environmental degradation. Their intentions are certainly pious. The pious attitude of saving/conserving everything approach will eventually save nothing and that is the reality. What we expect of the consultants are indications as to how to preserve essential life support system working and meeting the basic needs of life of the growing population. This the message I had been trying to pass across to the consultants.