Comments of the Panel of Experts of FPCO and the DoF on the Inception and Interim Reports of FAP 17, and replies by the Consultants.

October 1993

Prepared for the Government of Bangladesh

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SECTION 1

Comments of DoF and PoE (FPCO) to Draft Inception Report and responses from FAP 17.

{These questions/answers were attached to the revised Inception Report as Appendix IX}

Comments	Replies by the consultant
The contents of the report do not look to be well organized with a good sequence of the topics/sections. The Contents of the chapter on Introduction could have been divided into the background to the study, the objectives and scope, the TOR etc. as sections/subsections. Those on Methodology/Project Operation etc should have hinted in the different approaches for accomplishing the different objectives of the study. These approaches appear to be scattered in the report.	Addressed in edit.
It might be appropriate to restructure some of the headings and possible put a summery at the beginning of the report, with a clear Concise statement of the objectives and goal, and the outputs.	Addressed in edit.
The very first para of INTRODUCTION will bear out that the sentences have not always been carefully composed and that some words have not been correctly spelled everywhere. Spelling mistakes have been discovered here and there in the report.	Addressed in edit.
The report is not well organized. The same topic is discussed here and there without any reference. In fact, it is hard to ascertain what's in the report and what's not, without a painstaking search.	Addressed in edit.
The report could more clearly lay out the programme for determining the required indicators of production which could then be applied in areas of similar habitat types for yielding estimated impacts in areas other than those that have been sampled.	Addressed in edit.
The report could more clearly lay out the study areas and how and when the data will be made available to the other studies, under the FAP.	See Appendix VII.
A plan should be developed for aquaculture mitigation measures to be followed by the regional development programme. FAP 17 could specify guidelines for the development of fisheries through aquaculture.	See Appendix II.
Hydraulic suggestions for mitigation could be spelled out in the form of a state of the art guideline on what is known to date. This could be modified as necessary.	This will be submitted in a separate technical document.
In the present Inception Report on FAP 17 (Fisheries Studies and Pilot Project), the Consultant Team (CT) has given a wrong title as Bangladesh FAP 17 Fisheries Study. It cannot be taken as a matter of inadvertence. Because, in the Preliminary Inception Report (July 1992) the CT called the FAP 17 a Study of the Freshwater Fisheries, although the TOR say that this FAP will be national in scope with its activities spread over all the FAP regions including the SW Brackishwater Fisheries.	This is addressed in the edit and has been exhaustively discussed with interested parties. The project sites have been agreed.
The Contents do not indicate the important aspects of the studies on impact assessment, socio-economics, designs for fish pass structure, preparation of the TOR for the Phase II.	Addressed in edit.
Social Issues proposed to be covered in the study seems to be little on the ambitious side. Is it not possible to delineate the welfare objective into minimal, maximal and in-between under different types of flood control projects?	The detailed field methodologies will be reported in the Interim Report.

Comments	Replies by the consultant
p.4, para last Preparation of the Aquaculture Pilot Project should have commenced in month 8 and preparation of pilot stocking project in month 19. Project duration was 24 months as approved by TAPP (01.01.1991 to 31.12.1992). The new Team Leader joined in February, 1992, and ultimately the Project life has been extended till June 1994.	Addressed in edit.
Appendix IV: Sample Survey Appendix IV does not include adequate number of sample survey forms. The few survey forms designed would not help collect the data required to accomplish the specific objectives of establishing the existing conditions of the rivers, the beels and the flood plains, assessing the influence of FCD/FCDI projects on hydrological and limnological conditions, assessing the socio-economic changes in the living conditions of the fishing community and of those who do not usually benefit from FCD/I projects.	The details of field tested methodologies and processing algorithms and preliminary results will be given in the Interim Report.
Different survey forms should be designed for the different types of Fisheries such as the Beels and Rivers. The Catch Assessment Survey Forms as designed for the NC and the SW Regions would provide very limited information on the existing situation, the problems and the prospects. How about the fish/ shrimp production and value per Household Type? And how about the data on distribution and production capacities of the hatcheries and the nurseries? How about the market survey questionnaire, Household Survey for the Socio-economic Studies and Fish Migration record format?	The details of field tested methodologies and processing algorithms and preliminary results will be given in the Interim Report.
As to the Site Description and Water Quality Survey Form, inclusion of other parameters as listed below are essential: (i) Main Drainage, (ii) Water Supply: Degree of Flooding, (iii) Pollution, (iv) Immediate Shore, (v) Surrounding Village, (vi) Use of Water (vii) Fishing; (Public fishing, Easily fished), (viii) Species of Fish Caught/Available, (ix) Spawning Grounds, (x) Predators, (xi) Air Temperature, (xii) Weather (present and preceding), (xiii) Salinity, (xiv) Plankton samples, (xv) Other Natural Food etc.	It is not possible or desirable to include such a complex set of variables on one survey form. Many of the variables mentioned are collected within the fisheries and socio-economic surveys.
Appendix V As many as 27 expatriate consultants have been shown here against 19 while only 24 local consultants and 14 GOB personnel have been shown against 37 and 28 positions respectively, as provided for in the TOR.	This is incorrect. See Appendix III.
Further, a Bangladesh Consultant has been shown as an additional Co-Manager of the Project, for which, no provision exists in the TOR. Moreover, this consultant is to specialized in Fisheries as required in the TOR.	This matter has been discussed and settled.
In both Option 1 and Option 2, a major deviation from the approved TAPP and Project memorandum in observed. On acceptable option of staff requirements showing the fund provision may be appended.	Addressed in edit.
Qualification with experience and job descriptions of each of the professionals need be provided in an Appendix.	This has been provided to DoF and FPCO within separate documentation.

Comments	Replies by the consultant
Appendix VII: This Appendix is entitled 'Local Consultant Team' in the Contents Page of both the volumes submitted; but in the body of the report, only the socio-economic team has been shown, leaving out the Fisheries Team. What is the justification?	Addressed in edit.
Listing of equipment shows a major deviation from the approved TAPP and Project Memorandum. Requirements of additional equipment may be justified.	Addressed in edit; as agreed with DoF
Appendix X: The CT has suggested two options of work plan for fisheries assessment and socio-economic component. The acceptable option may be suggested in the Inception Report.	Addressed in edit.
p.3, Para 1, Subsection 1.1 (Flood Period) Generally there is no flood in the month of December. Actually receding of flood water starts in October. Early fish flood occurs in the month of April and May in the North East Region. The flood period extends from April to October and dry period lasts between November and March.	Addressed in edit.
p.7, para 3, Subsection 1.21 (Design Study): Some of the recommendations from the Design Study did not conform to the TOR. The matter was discussed in a meeting held on 12 September, 1991 and it was decided that the CT would prepare the Final Design of the Study Report following the TOR and that they would set 2 more field stations - one at each of the Brackishwater and the Haor areas.	This issue has been discussed and decided on.
Subsection 1.23.2: The scope also includes the job of location of the spawning groups of major fish species vide 3.1(b) on p.2 of TOR.	The spawning sites within project areas are being delineated by studies of reproductive biology and hatchling dispersion.
P.8-10, subsection 1.25 - 1.32 According to Project memorandum TOR 1 relates to Fish stock assessment. In the inception report this has been changed in the name and style of 'Establish the existing spatial and temporal conditions of river and floodplain capture fisheries'. The activities proposed under the TOR should be designed in such a way as to enable the team to come-up with a reliable assessment of Fish stocks of open-water fisheries. The reason for revising or modifying this TOR has not been explained. It may be mentioned that stock assessment is that primary job of the FAP-17 Fisheries Study and Pilot Projects and this should be reflected in the Inception Report.	Only the title "Fish Stock Assessment" has been deleted none of the activities of the ToR have been reduced. The term "Fish Stock Assessment" applies to a group of organisms of one species inhabiting a particular geographical area. Stocks are discrete groups which show little mixing with adjacent groups. Because we cannot be sure of the isolation of species in different habitats, strictly speaking we should not refer to FAP 17 activities as " Fish Stock Assessment". We are however measuring the stock parameters such as growth and mortality in different indicator species in different habitats.

Comments	Replies by the consultant
The original TOR 2 on 'Seasonal movement and spawning areas' provides for special studies to establish the seasonal fish migration patterns, feeding grounds and spawning areas of the main species of importance in capture fisheries. Proposed activities have not included this very important component. This should be incorporated in the Inception Report.	This information is being provided by fish biology and catch composition data. Addressed in edit.
P.9, Subsection 1.28 Assessing the influence of FCD/FCDI schemes and other flood control measures and also predicting the nature and magnitudes of the Fishery impact are very important objectives of the FAP-17. These impact have also been talked about here and there in the present Inception Report (Fig. 1 and Table 1). But what methods are being followed for quantitative assessment of the potential impact on the capture fisheries and on fish productions a whole? The methods of determining the effects of FCD/FCDI options on fish production and catch value should be outlined for both capture and culture fisheries in without-project and with-project situations. The impact assessment methodology and work plan is indispensable in an Inception Report.	Because of technical and resource constraints FAP 17 is not producing estimates of the impact of FAP on fisheries as a whole. Even with adequate resources this would be impossible to do until the feasibility / detail design studies were underway and the details of the engineering structures known. FAP 17 is producing Guidelines for Fisheries Assessment to be used in to assess impacts of future flood control programme.
p.9, subsection 1.29 and 1.31 Of the jobs of the TOR, providing information for optimizing the Fishery Impact and designing appropriate fish friendly structures and indeed the jobs of crucial importance. Nothing has been indicated yet as to the approach to the most appropriate designs for Fish Pass structures.	This information will be provided in a separate technical document.
p.9, subsection 1.32 Details of the Pilot Aquaculture and Pilot Stocking Project must be developed in Phase I. But there must be a time frame for the Phase I and Phase II activities. As it appears from the Activities Chart in the TOR, the designs for the Aquaculture Pilot Project and the Fish Stocking Pilot Project were scheduled to be completed within the first and the second year respectively.	See Appendix II. Addressed in edit.
p.11, para 3.1.1 (Recruitment of Local Consultants) It was decided in the meeting held at the MIWDFC on 6.9.1991 that DOF will recruit the GOB personnel and local consultants will be recruited through a consulting farm as per existing procedure of the Government. The ODA has recruited and fielded fisheries experts directly and Socio-economic experts through consulting firm.	This has been exhaustively discussed and decided on.
P.11, para 3.1.2 (Short-term Expatriate Consultants) The man-months of these short-term consultant should be mentioned in the Inception Report.	Addressed in edit.
P.12, para 2, subsection 3.1.4 (Extension of Expatriate Consultants): Six (6) months' extension of Computer Specialist and 12 months' extension of Anthropologist should justified.	Justification was and is provided.
p.13, para 5, subsection 3.1.10 (3rd sentence): Who will supervise the activities of DOF field personnel, proposed to be used by the project.	Addressed in edit.

Comments	Replies by the consultant
P.14, para 2, subsection 3.1.13 (2nd sentence): A short description of local consultant companies need by given along with their role and functions in the project activities.	Addressed in edit.
p.13, para 3, subsection 3.1.8 (DOF Sr. Personnel): The Department of Fisheries (DOF) has recruited 1 Statistician (22mm) and 4 Senior Fisheries Scientists/Sr. Limnologists (96mm) for the project period as per provision of the TAPP and TOR with a view that these personnel will get experience during study period and will continue to work in the second phase of the project (Aquaculture and Fish Stocking Pilot Project). The DOF has designed Deputy Chief of Planning and Senior Scientific Officer of FRSS to coordinate the project activities for facilitating technology transfer to DOF. The Project Team leader has appointed 14 additional Fisheries and Socio-economic experts (1 Sr. Fisheries Scientist, 1 Sr. Limnologist, 4 Fisheries Supervisors, 1 Nutritionist, 1 Anthropologist, 1 Biometrician, 1 Sr. Technical Officer, 4 Socio-economic Supervisors) beyond the provision of approved TAPP. Recruitment of such a large number of additional local expert should be justified.	Addressed in edit.
p.14, para 4, subsection 3.1.9 (DOF Personnel) In the FAP TAPP, there are provisions of 12 Fisheries Scientists, 8 Limnologists and 1 Anthropologist for a period of 12 man-months. The DOF has recruited 15 entry grade Fisheries Scientists/Limnologists/Anthropologist for a period 12 months. Their services may be continued till the completion of the project so as to utilize their experience in the three working stations of North-Central Regions. Two more Survey Officers will be designated for the South West Region after the CT will select the working station in that region. Mention may be made that DOF has recruited new personnel and designated existing personnel just after selection of working stations by the CT. These should be reflected in the Inception Report.	Addressed in edit.
p.14, para 1, subsection 3.1.12 (Local Staff) The period of short-term consultants have not been mentioned in the Inception Report. Some of the experts namely Sr. Fisheries Scientist, Sr. Technical Officer have been working since the beginning of the project. Duration (man-months) of the short-term Consultants should be specified and recorded in the Inception Report.	Addressed in edit.
p.14, para 3, subsection 3.1.14 (Consultancy Staff) The Socio-economic Team has been appointed and fielded by the ODA. The Team Leader has submitted the bio-data of socio-economic expert to the DOF and FPCO after appointment. The main report of the technical proposal of the consulting firm has not yet been submitted by the Team Leader.	Done.
p.15, para 2, subsection 3.2.4 There is no provision of regional supervisors for fisheries and socio-economic activities in the TAPP and Project Memorandum. Fisheries and Socio-economic experts were supposed to supervise and guide the field activities as well as analytical work of the studies. Additional provision of 8 Local field supervisors for Fisheries and Socio-economic field activities should be justified.	Addressed in edit.

Comments	Replies by the consultant
p.16, para 2, subsection 4.5.2 (Option 2) After a threadbare discussion in the tripartite meeting held at the MOFL, the project end date has been extended to June 1994 as shown in the appendix IV and not until July 1994. This extension may be acceptable as per decision taken in the tripartite meeting held on 6 September 1992 to cover two monsoon seasons in the studies. Costs for man months increase should be highlighted in the report.	Addressed in edit.
p.16, para last, subsection 4.9 (extra funding) Itemise extra funding requirement of extension should be highlighted for revision of the TAPP.	Addressed in edit.
Data Collection: Although a main goal of the project is to assess the impacts of the FCD/I projects on fishery production, there is too much effort directed toward the repetitive sampling of relatively few (mostly physical) variables at the expense of several others that may be more important in understanding fish production dynamics.	Time and resources limit the number of variables that can be measured. Although an understanding of fish production dynamics is of interest and is being addressed in the fish biology studies. Given the objectives of FAP it is more essential to address the issue of impacts.
An important consideration is that this study provides guidelines for regional and future project feasibility studies for the estimation of impacts of FCD on fisheries in the project areas concerned.	Addressed in edit.
A plan should be developed for aquaculture mitigation measures to be followed by the regional development programs. FAP 17 could specify guidelines for the development of fisheries through aquaculture. This could include investment guidelines and institutional suggestions for securing higher levels of fish production through aquaculture, and the regional studies could be given the guidelines now. The guidelines could be developed now based on existing country knowledge which does exist. These guidelines and investment criteria could be adjusted as the pilot project or additional field information comes on line.	Addressed in Phase II of FAP 17. Initial financial indicators for assessing economic feasibility will be provided by the PIM for Phase II. See Appendix II.
p. 47, para 6 The pesticide study referred to here seems to me to be outside the FAP 17's scope of work. The study already is very ambitious and this is just one more thing which could be done by one of the Universities.	This small study has been completed; the report will be submitted soon.
p.9, para 5 The report goes from TOR 4 straight through to TOR 7. What was TOR 5 and 6? Or do they not exist, or have they been eliminated.	Addressed in edit.
CATEGORY 2 It is not understood why vegetation list has been limited to 21 types only. Some other types of vegetation are also available in different beels of Bangladesh.	Reference?

Comments	Replies by the consultant
p.14-15, para top, subsection 3.2.2 We fail to understand why Faridpur in the South West region is being sought at, ignoring many other pertinent and relevant districts of the region when the first and the foremost objective of the project (FAP-17) includes a study of shrimp production, and all the five FAP regions including the South West brackishwater region are within the scope of the Project, After a series of meetings on this issue, it has ultimately been decide din a meeting on 15 November 1992 that the project Team would immediately visit the South West Region to select a functional station which will cover the brackishwater area as per provision of TAPP and project memorandum.	This has been exhaustively discussed and decided upon.
p.16, para 3, subsection 4.6 The field activities in the South West Region could not be started even in November 1992 as scheduled ultimately because of the inordinate delay in selecting the field station in the region. The reason for this delay should be highlighted in the report.	
p.29, para 3, subsection 6.3.24 (2nd sentence) Any effort to set up a mechanism to monitor the implementation process of the fishery policy?	Information will be gained in socio-economic data.
p.33, para 1, subsection 6.5 (Mitigation of Impacts) Does the investigation include all the different components of the capture fisheries including Borrow pits and culture based capture fisheries?	The studies incorporate the most important (productive) capture fisheries; aquaculture issues are addressed in the socio-economic studies of Phase I and by Phase II.
p.36, para 1, subsection 7.1 (Field Sampling) It is unfortunate that the selection of proper sites specifying the selection criteria, appropriate planning and work programme with details of who would do what, where, when and how, are yet to be completed.	Details will be included in Interim Report.
p.37, para top, (Project Study Area) No field station at Faridpur has been entertained. The team leader has been advised to identify a station in this South West brackishwater area and to justify his identification with selection criteria in a meeting held at the DOF on 15 November, 1992.	This has been exhaustively discussed and decided upon.
p.57, para 5, (Special Studies) The selection of special Studies should be based on the environmental key issues. The relevant institutions (FRI, FPCO for example) and departments (DOE, DOF, and those at Universities etc.) should be consulted before the topics are finally selected so as to avoid duplication.	
p.66, para 1, subsection 8,4.2 (Database) Comments have already been offered on the questionnaire survey forms (Appendix-IV)	
p.66, para 2, subsection 8.4.3 (Fish species) An appendix on the fish species identified habitat wise with indication of species that are or likely to be threatened and of those that have become extinct should be provided.	This is a possible output of FAP 17 and not one that can be possibly included in an Inception Report.
p.68, para last, subsection 8.9.1 (Work schedule) A check list of activities has been provided but without any time frame, potential resource persons etc. etc.	

Comments	Replies by the consultant
There is an urgent need to develop some relatively simple indices that floodplain fish production managers and EIA assessors could use. Once developed, these measures would have a long term usefulness in Bangladesh and could be applied in the numerous situations when full data sets are not available. Often these indices and conceptual models are related to the trophic status of the water body. The data collection program, however, has few if any parameters to be collected that could be used in formulating a custom-designed index for Bangladesh.	Ideally, it would be interesting to explore the links between trophic levels within the food web network of the floodplain ecosystem and their undoubted theoretical influence on fisheries production dynamics. However, the complexity of the system, time span of the Project, and financial and resource constraints preclude such an approach. This response can be applied to most of the comments below.
Why aren't there some measures of nutrients and primary production (plankton and macrophytes) at the main sampling sites? If these data are missed, the subsequent analysis of the data will be severely limited. Likewise, measures such as water colour are not very useful and cannot serve as surrogates for the trophic parameters. At least, the thirty stations should receive a complete physical, chemical and biological characterization 2-3 times during the study. Some measures should be made of the bacteriological quality of the water.	
The biological data base is severely limited and should be improved. Some basic information should be collected on the food webs at each of the stations for both benthic and pelagic species with a view on how these systems are coupled in terms of their food webs and nutrient/energy flows. Many of the FCD/I impacts can feed through food web phenomena indirectly and all of these will be missed if there is not some basic information on benthic and pelagic prey populations and stomach analysis.	
It would be helpful to have a table showing the overall data frame to be collected in each of the major 30 sampling sites over time. The discussion on data collection is fragmented and is not always depicted similarly in the data collection forms in Appendix IV and the summary table in Appendix XIII. The latter table is a start on the data frame but it does not have enough information on sample replicates, sample frequency, sample position etc. Will key fish and their habitats be sampled differently form the routine surveys? It might be useful to think in terms of low, medium and high intensity sampling programs. Hach kits are being purchased as per the equipment Appendix; but their use does not appear in Appendix XIII.	
There will be a dearth of habitat quality and typing information at the end of the study. This should be rectified. Although it will be possible to quantify the areal extent of particular fish species distributions, it will not be possible to weight these habitats in terms of their potential for fish production and biodiversity. A basic characterization of the seasonal changes in vegetation should be made at each site and with other basic habitat etc.	

Comments	Replies by the consultant
If the thirty stations were adequately characterized by a more ecologically meaningful set of variable (physical, chemical and biological), it would be possible to conduct a much more extensive statistical analysis (bivariate and multivariate) as well as food web network models, trophic indices, and trophic models. If the data set presently described is collected, subsequently analysis will be extremely constrained.	
Why has no thought been given to a radiotelemetry study of fish migrations? often a little bit of high technology can give a surer answer with much less effort and resources.	
Why won't there be any aging analysis (fish scales). Fish age may be a critical parameter for particular fish modelling efforts. Stomach analysis at key times of the year on the 'core' species should be undertaken to understand basic food web dynamics. No more than 20 species should be considered in the core (the report mentions 13). These should be described and justified on several criteria: commercial importance, social-cultural importance, ecological importance, surrogate for other more-difficult-to measure species, etc. The more specialized fish measurements should be restricted to the core species but a lot of care should be taken in selecting the core species.	
The data on gross deformities, scale disease, liver and gill abnormalities etc. give a good indication of the polluted nature of aquatic environments and can save a lot of chemical analysis and pin point locations where more detailed chemistry is needed.	
Why aren't fish length, weight and condition recorded on the same form? The use of too many forms with too little information or redundant information wasteful and can lead to a lot of data transition errors.	
On p.47, the authors state they will study eutrophication. No, they won't, unless the data frame is considerably improved.	
It was difficult to understand the range of fishing gears that will be used and how ti relates to the basic data frame. For example, will there be any gill netting ? Could this please be better explained. Immature fish area notoriously difficult to sample. What provisions have been made for this group?	
Besides the socio-economic consequences of moving a human population from a open water capture fishery to a culture one, what are the ecological consequences, and are they important to the goals of this study?	
The sections on fish modelling seemed quite confused and unclear exactly what will be modelled. For population and community modelling, the core species should again be featured. What is the basic approach to modelling? Which are the likely models to be used? If this is not known and agreed upon at the beginning of the study, it will be difficult to conduct thorough data analysis at the end.	
What is being planned for estimating density dependent parameters for the core species for fish production/population modelling? If literature values are going to be used, many have been developed in a north temperate environment - are they applicable? How will you solve this problem?	

Comments	Replies by the consultant
Mitigation Measures It appears that three basic forms of mitigation have already been decided upon: fish stocking, fish passes, and aquaculture. This seems somewhat premature. What about habitat manipulations and enhancement, engineered wetlands, and combined agricultural - aquatic developments? Are there critical portions of the life history that require different types of mitigation for the core species? Again, if the basic ecology of the species are not understood at the end of the study because the data have not been collected, then particular mitigation measures that are ecologically realistic and economically feasible might be missed.	
The report begins with a summary that includes among other things a clear listing of the deliverables and the time required for each. This could be done for example by the development of a table using horizontal time bars. It would be useful to know up front where and when the main outputs will be available. Under the section of project scheduling (4) it would have been useful to have shown the schedule for the planned activities. The time schedule for the deliverables should reflect the more urgent needs of some areas over that of others.	
There is a need to acquire through this study reasonably accurate estimations of aquatic production in the main habitats to be affected in the future by FAP interventions. The report could more clearly lay out the programme for determining the required indicators of production which could then be applied in areas of similar habitat types for yielding estimated impacts in areas other than those that have been sampled.	
The report could more clearly lay out the study areas and how and when the data will be made available to the other studies under the FAP.	Addressed in edit.
Also with regard to mitigation, it would be useful to provide the institutional set-up under which the mitigation could be carried out. Possibly a set of guidelines could be followed for the development or use of existing institutions in ensuring fishery development and increased production.	Addressed in edit.
The modelling work needs to be decided upon and clearly laid out as to what will be done with the appropriate man months provided for the modeller. The modeller should be brought out early on to set up the design and should have more time allotted than shown in the inception report. Again a well designed model or set of models would go a long way in aiding FAP in the analysis of fishery impacts not just in the study areas but over the entire floodplain.	Addressed in edit.
p.49, para 6: Seasonal effects need to be taken into account as they have been shown to be significant in the past.	Addressed in edit.
One of the disbenefits seen in other FCD projects has been the tendency of water hyacinth populations to build up in channels that have reduced flow because of embankments an sluice gates. The water surface coverage of water hyacinth then causes reduced levels of nutrients in the water a ultimately reduced planktonic organism production. Indirectly then fish production is reduced. This disbenefit or impact might also be evaluated or assessed.	

Comments	Replies by the consultant
Acronyms: Some of these (ARC/INFO, ADAB, BCEL for instance) have not been spelled out alright. SPARRSO has also not been correctly spelled out. How about the first 'R' ? And why Bangladesh ?	Addressed in edit.
p.2, para 3, Appendix 1 Where can we see 4.4 below ? There is no such subsection in your appendix 1. Socio-economic studies have been discussed in para 2 on p.3 of he Appendix.	Addressed in edit.
Appendix II & III Appendix II covers about 30 and Appendix III about 50 computer-printed pages respectively on maps and documents available in the library. Have they all been referred to, in the Inception Report? These appendices should be excluded from the Inception Report. Many of the possible sources of Fisheries Publication in Bangladesh have not been explored, and as such, many of the useful literature have not been documented in the Appendix III. Access to the publications in different universities, institutes, departments, especially to the Inventories of Fisheries Research in Bangladesh recently published could better provide such literature subjectwise. The survey forms should be simplified and not so clumsy as the Catch Assessment Questionnaire Form looks like.	Addressed in edit.
Appendix VIII & IX: Listing of the Computer and Scientific Equipment, Glassware and Chemicals with their cost price etc. is redundant in an Inception Report. Whether the equipments are provisioned in this TOR and TAPP.	Addressed in edit.
p.8, para 4, subsection 1.24: Where are the items 1.20.1-3 and where is the item 1.20.4? These sorts of careless write up are sheer wastage of the readers valuable time.	Addressed in edit.
p.16, para 1, subsection 4.5.1 (option 1) As per approved TAPP, the original project deadline is December, 1992. As the project activities started in December, 1991, the deadline of the project should have been December, 1993.	Addressed in edit.

SECTION 2

Comments of FPCO on Revised Inception Report and responses from FAP 17.

{These questions/answers were attached to the revised Inception Report as Appendix X}

Sl.No.	Comments	Replies by the consultant
1	The present (revised) Inception Report submitted in April 1993 has been dated October 1992. The report should be dated April 1993.	Addressed in latest edit
2	The wrong title of the FAP-17 are used by the Consultant. The title of the project is FAP-17 Fisheries Studies and Pilot Project. None can agree to the change of a FAP Title, after about 1½ years of its implementation.	Addressed in latest edit
3	The consultant should link their FAP-17 study to other FAPs namely FAP-12, 13, 14, 15 and 23 in addition to what they have listed, as well as to other concerned organizations/institutes (BFDC, FRI) and departments (DOF, DOE etc.).	Refer to paras 3.2 and 3.3
4	The study will therefore have to address at some length the issues of (i) Peoples participation; (ii) Policies and institutional strengthening focusing on measures to heighten awareness, promote integrated planning and coordination among the relevant ministries and ensuring intersectoral trade off.	Main objective of the project is to establish data, indicators, guidelines which will make integrated planning and inter-ministerial coordination easier.
5	If the study could enlighten us on at least 10 species of over 260 species of fishes in Bangladesh floodplain, on aspects of natural history and ecology (life cycles etc.), habitat needs and fishery management issues, a meaningful understanding of the needs could emerge.	The breeding biology, movement, at different stages in the life cycle, of in excess of the species are being examined in relation to potential impact of flood control.
6	Many of the 94 comments as offered on the draft inception Report of October 1992 have not been replied. It is expected that they would now be responded to.	This was the result of errors in page ordering and enumeration. This error has been corrected.
7	Cover Page Has the report been prepared for FPCO ? This should be a property of the GOB.	Addressed in latest edit.
8	p.4, para 1-5 Of the 9 objectives that are to be accomplished during the Phase I (as required in the TOR), important ones such as preparation of TOR for Pilot Project and that of the appropriate design for Fish Pass Structures are missing.	These TOR's and report are included as immediate objectives and outputs in the Project Framework.
9	p.4, Para 1-6 The study is stated to have 7 (seven) immediate objectives of which, the 7th one is missing from what have been stated here. How about 1.6.7 ?	Addressed in latest edit.
10	p.15, para 4.1.4 Have the 6 months "extensive for the Computer Specialist and 12 months" extension for the Anthropologist been approved by the GOB ?	Yes.

Sl.No.	Comments	Replies by the consultant
11	p.15, para.4.1.7 How has the input of the Hydraulic Engineer been extended from 2 to a 3 months programme and other inputs reduced by 1 to 3 months ?	In response to the needs of the project which evolve during implementation.
12	Appendix III Personnel requirement as shown here in the Chart shows recruitment of GOB Fisheries Anthropologist. Is there any such discipline ?	An anthropologist with special knowledge and/ or experience of fishing communities can legitimately be referred to as a fisheries anthropologist.
13	p.19, para 5.8 Inputs of personnel in respect of man months as shown in Appendix V do not quite agree with those provided for, in the TOR/TAPP. Those for the expatriate personnel (183 m/m) slightly exceeds the TAPP provision (173 m/m) while those for the GOB personnel as shown in the said Appendix are greatly under provisioned (only 125 against 396 m/m).	The level of GOB personnel is lower because of excessive demands on/ lack of available personnel within GOB. The increase in expatriate man/months is small and considerably less than the 25% extension in time for the project as a whole.
14	p.30, para 6.3.7 Table 2 indicates qualitative impacts - the nature and magnitude of the effects of Flood Control interventions upon capture fisheries. How have they been ascertained? One of the GOBs in the TOR is to do this qualitative job and also to quantify the impacts. What are the work plans for such impact assessments ?	For work plans referred to, see Appendix IV.
15	Have the Guidelines for Project Assessment (GPA) prepared by FPCO been followed ?	Project understanding of the GPA's is (a) that there are for members of teams undertaking "Regional..... Studies and feasibility studies for investment projects under the Flood Action Plan". (GPA, page 1, para 3 "Purpose and Scope of the Guidelines").
16	Appendix IX, Sl.No. 2 Not properly addressed in edit. The summary does not indicate the important Phase I objectives.	These are clearly indicated in the Project Framework, Appendix V, which is itself a summary.
17	Appendix IX, Sl.No. 3 It could give the important objectives only and the expected outputs instead of listing 7 objectives and dealing at length with background issues.	Project Framework provides these objectives and outputs.
18	Appendix IX, Sl.No. 9 None would now agree to the change of a FAP Title. The title should remain unchanged.	Address in latest edit.
19	Project sites are OK but the studies on the SE region are imperative.	At the request of GOB, and following a tripartite GOB-ODA-Project agreement, SE was removed from the schedule after resources had been utilised to establish field operation in that area.
20	Appendix IX, Sl.No. 25 If incorrect, what are the correct figures? How has the BC Project Co-Manager been employed and why has not been right man appointed against this position, as was required in the TOR?	Please refer to Sl.No. 13, above.

Sl.No.	Comments	Replies by the consultant
21	Appendix IX, Sl.No. 44 Over and over again, the Consultant is coming up with plea of time and resource constraints, even it has been allowed an extension by six months.	The Project Document explicitly indicates that well established, standard techniques will be used. The Project cannot be used to develop new models. The complexity and practicality of what is required to produce such models or indices can be easily underestimated. An example of impracticality would be radiotelemetry: the Team has deemed this to be an unpractical method in the field conditions. However, any suggestions as to how this may be applied in those conditions would be welcomed. We would suggest that discussions between the field team and the proposer of the method be held at the earliest possible opportunity at an appropriate field site.
22	Appendix IX, Sl.No. 83 Not properly addressed. As stated against Sl.No. 7, Appendix II does not indicate preparation of the TOR for Aquaculture and Stocking Pilot Projects, as required in the Phase I Fisheries Study objectives.	Appendix II is a draft of TOR's for the work which is to be carried out to prepare these Pilot Projects.
23	para 1.26.4 The study should develop a coherent short and long-term plan of operations to encourage the participation of user-communities in management of fisheries.	Phase I is primarily concerned with the definition of the problems caused by flood control measures. Mitigation - including plans for improved community participation and fisheries management - can be properly addressed only when the problem has been defined.
24	Appendix VIII What is the quality control mechanism for the data collection process ?	- substantial training period for data collectors - daily self-checks by enumerators - on site daily supervision by senior local personnel - weekly checking of forms by enumerators - spot supervision by senior UK personnel - continual supervision in field by GOB mid-level supervisor - data checking by senior local personnel - registration of documents used in field - batching and recording of documents returning from the field. - checking and counting documents - spot checking of data entry into computer - automatic validation of codes - automatic checking for duplication of entries - cross-referencing between survey froms - cross-referencing between surveys - all single entries cross referenced to sheet and batch numbers - secure storage of raw data on original documents - continual back-up of database, storage both on-site and off-site. - back-up and security arrangements during transport/transfer of data.

Sl.No.	Comments	Replies by the consultant
25	p.3, para 1.4 There has been a lengthy discussion on the background and issues including those on capture fisheries production; but nothing has been stated about the culture fisheries production and about the beneficial impacts of the FCD/I activities.	These aspects are subsumed within the mitigation and compensatory mechanisms referred to in the paragraph.
26	p.21, para 6.2.4 What are the work plan for studies of the fishes life cycles? What are some of these fish species for which life cycles, migration patterns, feeding grounds and spawning areas are being established? How about the food and feeding habits of some such important fish species?.	Plans are to examine spatial and temporal difference in fishermen's catches which an based on weight and number of individual fish species; plus dedicated studies of reproductive condition of selected species to identify breeding grounds and seasons; plus research studies investigating passive drift of fish hatchlings and fry; plus feeding studies in cooperation with Bangladesh Universities.
27	p.26, para 6.2.15 The position of cat fishes in Bangladesh as to their migratory habits is not that unclear. Mystus and Wallago spp. do show local movements upstream and primarily migrate laterally onto the floodplain for spawning.	Project investigations so far indicate that some Mystus spp. are resident floodplain.
28	p.26-27, para 6.2.18 Here again, the CT has planned to go for impact assessment within four regions of Bangladesh. How about the 5th region?	See Sl.No. 19 above
29	p.35, para 6.5.1 Measures for mitigation need to be detailed so that they can be costed earlier for inclusion into the projects economic analysis. Are there no such measures? How about trading off, development of fish sanctuaries, development of institutional and infrastructure facilities, management measures etc.?	See Sl.No. 23 above
30	p.39, para 7.2.4 Why four FAP regions were selected as key sampling areas excluding the South East region? We agreed to omit Chandpur as a field station as the CT was reluctant to establish any station in either of the two important regions- the South West and the North East. The scope of FAP-17 includes all the 5 regions.	See. Sl.No. 19 above
31	Environmental variables Inclusion of some other parameters (as many as 15) was suggested but none has been included. Are they not relevant or important ones? Data on main drainage, water supply, pollution, spawning ground, fish spp. predator, plankton samples etc. are all very very important and relevant parameters. Local names of the fishes should be followed by scientific names.	Agreed. However, previous long-term research indicates extreme complexity in the aquatic system which cannot be addressed within a short-term planning study. A number of easily measured parameters which provide a simple description of water quality are included. Data on drainage and water supply are collected. Pollution is not a problem at most sites.
32	Appendix VII Why has the South East Region been excluded?	See Sl.No. 19 above

Sl.No.	Comments	Replies by the consultant
33	Appendix VIII The Catch Assessment Questionnaire still looks clumsy. It should include questions on total catch for a day, for the last 7 days, for the last month, for the last year and for a time 10 years ago, on the part of one fisherman/one group. For different types of Fisheries (Rivers, Beels etc.) different survey form are needed. How about General Fisheries Survey Form for data on the existing fisheries resources, fisheries production an socio-economic benchmark, the institutional and infrastructure facilities, constraints etc.	The Catch Assessment and other questionnaires have been fully field-tested and are producing the required information. A complete set of survey forms will be provided in the Interim Report.
34	Appendix IX, Sl.No. 5 It is hard to find out the programme for determining the production indicator. Replies should have been more adequate.	Detailed analytical steps and corresponding computational procedures, along with illustrative results, are being provided in the Interim Report.
35	Appendix IX, Sl.No. 6 Selection of study areas looks alright; but why has the South East Region been excluded?	See Sl.No. 19 above.
36	Appendix IX, Sl.No. 7 Appendix II does not show the detailed aquaculture mitigation plan with costing guidelines for the options identified.	See Sl.No. 23 above.
37	Appendix IX, Sl.No. 24 For a site description and water quality assessment, the variables suggested need to be known. To avoid complexity, another survey form may be used. We don't come across any other fisheries and socio-economic survey forms.	See Sl.No. 33 above
38	Appendix IX, Sl.No. 41 There should have been a list of the Survey forms under the Appendix VIII. Where do we find the fish biology and fish composition data that can establish the seasonal fish migrating patterns, feeding ground and spawning areas of the man species?	See Sl.No. 33 above.
39	Appendix IX, Sl.Nos. 51-54, 59-68, 73-74 Why not replied to?	See Sl.No. 6 above.
40	Appendix V. What is the basis of calculating the man months?	Assessment of projected outputs and workplans to achieve these.
41	p.1, Contents The organization of the contents seems now to have been improved but for the section on Synopsis of Project Activities (p.10) which (a 4-page long discussion) looks to be redundant under INTRODUCTION and could be appropriate under the chapter PROJECT IMPLEMENTATION/METHODOLOGY.	Addressed in latest edit.

Sl.No.	Comments	Replies by the consultant
42	p.2, ACRONYMS The comments on the Acronyms have not been properly addressed.	Addressed in latest edit.
43	p.5, para 2.1 Lack of proper editing is still apparent (vide the 1st and the second sentences).	Addressed in latest edit.
44	p.15, para 4.1.7 How do you state that the report on investigations etc. are expected in November, 1992 in a report submitted in April, 1993 ?	Addressed in latest edit.
45	Appendix I: TOR (p.2-5) An what does FAD stand for?	Addressed in latest edit.
46	Appendix II, para 1 The abbreviation AMOD has been used but it has never been spelled out anywhere in the report. All readers are not familiar with all abbreviations.	Addressed in latest edit.
47	Appendix IX, Sl.No. 3 Not addressed alright in edit (take a look at the first and the second sentences)	Addressed in latest edit.
48	Appendix IX, Sl.No. 11 Our comments have not been addressed.	Approach adopted by the Project has purposely avoided arbitrary distinctions. Excessive ambition in project design has been tempered by initial field testing.

SECTION 3

Comments of PoE on the Draft Interim Report of FAP 17, and replies by the Consultants.

Comments	Replies by the Consultants
Patricia A. Lane, POE/FPCO	
Data collections: **Fish Production Study:**	
The main goal of the project is to assess the impacts of FCD/I related activities on fishery production. The data collection effort appears to be concentrated at landing sites (i.e., that main goal is to estimate catch per unit effort or CPUE) and no attention has been given to assess the trophic status of the waterbodies. There is a need to develop simple indices that floodplain fish production managers and EIA assessors could use independently of landing records. Landing records could potentially change for reasons unrelated to productivity, ecology or to FCD/I related activities.	Data collection is not concentrated at landing sites, but based on observations of, and interviews with, fisherman at work, as well as counts of gears in use in defined areas.
There are no measures of nutrients and primary production (plankton and macrophytes). The biological data base is severely limited and mainly consists of fish landings. Information on food webs at each of the stations should have been collected for both benthic and pelagic species. This is important because FCD/I impacts can affect food web phenomena indirectly. The consequences of such links will be overlooked if information on benthic and pelagic prey populations and stomach analysis are not collected.	We are not convinced that it is possible to produce simple indices accurately relating water chemistry and primary productivity to fish production. As estimates of impact on **fish production** were the primary cause of concern for the people of Bangladesh, we have concentrated on this. We have measured "key" water quality parameters, e.g. conductivity, which shows the source of flood water.
Stomach analysis at key times of the year on a set of "core" species should have been undertaken to understand basic food web dynamics. Table 2.4 provides some information on feeding habitats for 13 species. There is no indication of why these particular species were chosen or on how their feeding habits were determined. Were stomach analyses conducted or was this information obtained from the literature and/or interviews with local fishermen? The reliability of this kind of information depends on the source. Core species should be described and justified on several criteria; commercial importance, socio-cultural importance, ecological importance, surrogate for other more difficult-to-measure species, etc.	We are running a study on stomach contents for as many floodplain species as possible, i.e. about 30 common spp. chosen to cover a range of feeding types and life histories. Table 2.4 in the report is based on data from the literature.

Comments	Replies by the Consultants
The lack of an appropriate set of ecologically meaningful variables (physical, chemical and biological) precludes the possibility of conducting an extensive statistical analysis (uni- as well as multivariate), food web network models, trophic indices and trophic models. These data are critical to answering a large number of FAB/FAC/I questions. Without this information the overall usefulness of the study will be limited.	We are running a study on stomach contents for as many floodplain species as possible, i.e. about 30 common spp. chosen to cover a range of feeding types and life histories. Table 2.4 in the report is based on data from the literature.
There is no effort to assess variability in catch per unit effort (per gear) on different days within any given month. Such measures are necessary to provide confidence intervals for catch estimates.	Using our data we can look at the effects of different days of the week or month on CPUE in different habitats.
No provision was made to look at gross health (i.e., gross deformities, scale disease, gill abnormalities, etc.). These data provide a good indication of the polluted nature of aquatic environments. They can save a lot of chemical analysis and highlight locations where more detailed chemistry might be needed.	We do record apparent health status, based on external appearance of the fish, and are especially concerned with the incidence of epizootic ulcerative disease.
The relevance of demarcating site boundaries is not clear. Do these boundaries refer to the limits within which most landings take place? Or is this an arbitrary demarcation? What is the purpose of it?	Site boundaries are demarcated arbitrarily, using natural features of the landscape as "sighting lines", to allow estimates of catch per unit area to be made.
Table 2.1 on the possible impacts of flood control on fish production has several entries which are difficult to justify. It is argued that the reduction of flood depth may cause an increase in aquatic productivity and in breeding grounds. It is unclear what mechanisms could be responsible for such changes.	Shallower floodplain waters may support larger plankton populations, with importance as food sources for fry, and/or bigger stands of macrophytes to provide spawning substrates and shelter/protection for small fish against predators.
Table 2.3. Reference number FE01(A); the purpose of the information is probably to record the number of gears by type, and not the number of different gears, as reported.	Yes, this is correct.
2.25. Because sampling frequency is relatively low it is unlikely that the significance of weather conditions will be estimated independently of month effect.	Weather is monitored to explain observed low fishing activity. For practical reasons we found it impossible to sample more frequently.

Comments	Replies by the Consultants
Fish Population and breeding studies	
2.30. The argument that length/frequency data in conjunction with reproductive condition will enable assessment of whether movement of fish is related to spawning or feeding is dubious at best.	The sampling sites were specifically chosen throughout linked habitats, in order to trace the movements of fishes. If a high percentage of the individuals are ripe/running in a particular habitat, then it may be assumed they are in or near their breeding site. If individuals are not in breeding condition and are shown to be moving from river to floodplain (from catch comparison and length distributions from sequential sampling), then breeding is not the purpose of the movement. Short of mounting a full-scale fish tagging study, we believe the approach used gives the best indication of the motivation for fish movements.
2.31. There is no definition of a "model" species. It is unclear whether they refer to a modal length of a particular species for that season or a model species from comparisons among species. If the latter is the case; it is unclear what they mean by model species.	The term "model" species in our context may be replaced by the expression "key" species. These are species which are common in the catches from rivers and floodplains throughout the year. They are representative of a number of trophic levels and breeding strategies.
2.32 How are they going to compare length/frequency data from different gears when they may not have data on these different gears for the same season? For example, they chose seine nets for the collection of samples for length frequency analysis, but seine nets are only seasonally employed. They therefore say they will use other nets when seine nets are not available. Length frequency data obtained with different gears of different seasons may therefore not be strictly comparable.	The selectivities of different types of gears operating in the same habitat at the same time have been compared, and where there are sufficient similarities the data from a number of gears may be pooled. Examples are seine nets, lift nets, cast nets and push nets. During most of the wet season and during the rise and recession of the floods these gears are in use in rivers, canals, floodplains or beels. Samples for a number of gears are therefore available for most of the year. In the dry season, katha and kua are sampled.
2.38 Reducing the number of sites in a region and increasing the number of fish caught within any given site assumes that the distribution of length/frequency data is the same across all sites. Has this been verified?	In many cases fish samples from all sites are being collected, but some locations are not yielding sufficient. It is optimistic to assume we will be able to assess population parameters at every cluster of sites either inside or outside flood control schemes, and the analysis has always been intended to provide explanations of the differences in production of these comparable areas from the indications of change in population parameters.

Comments	Replies by the Consultants
Fish movement study 2.45 There is no detail given about sampling methodology and frequency. What is the meaning of ".. a continuous survey of..."? Radiotelemetry could have been used to study fish migration.	In the NC and NW studies, all hatchlings were collected from savar nets set by FAP 17, with the cooperation of local fishermen. Collections were made at intervals of 30 minutes to 3 hours throughout the day and night, the frequency depending on the density of hatchlings. Hatchlings were normally preserved on site in 5% formalin and later identified in the laboratory. As drift decreased the sampling interval increased. In the NW region the study spanned August to November 1992, and in the NC region collections are continuing on a twice weekly basis. Samples are taken every 3 hours from 0600 to 1800. Water velocities are measured to allow measurements of catch per unit time to be converted to estimates of hatchling density and number. Radiotelemetry could have been used for large fish, but the project's fisheries biologists chose other methods.
Fish population dynamics	
The modelling study is based on length/frequency analysis and ages are inferred from length data. However, there is no information on age-length relationships for any particular species. This is particularly troublesome in view of the fact that fish growth is extremely plastic and habitat dependent. Aging analysis of "core species" would have been expected.	In view of the time available for these studies, it was considered more practical to use rapid stock assessment methods. Since the data collection spans more than one year, inferences about the lengths of fish of different ages can be made from the progression of modal lengths. Expertise for ageing studies is severely limited in Bangladesh and the consultant would have had to train personnel in this field, which is a lengthy process. Some information for verification of the length frequency analysis will be available from the ODA North East Fisheries Project, which is attempting to age some of the same species being considered by FAP 17.
2.79 The statement about schooling behaviour and segregation into two size modes makes no sense in the context of this analysis, especially when data are pooled across sites, gear types, etc.	The comment is appreciated. The results and interpretations made in the interim report are merely illustrative. The discussion has ben presented in order to demonstrate some of the complexities of the fish population and the way in which information from the catch assessment, reproduction, movement and population dynamics studies is complementary and will provide a better understanding of the biology of floodplain fishes. Since the analysis is incomplete, it is accepted that some comments may be premature.

Comments	Replies by the Consultants
Dr. Ainun Nishat, POE	
Reports prepared under FAP will be read and used by professionals of various disciplines besides experts of fisheries. The Interim Report and the Final Report will provide input to planners involved in FAP studies and therefore, findings these reports should be clear to all of them. As such whenever a fish species is mentioned its common name must be cited (e.g. as has been done in Table 2.4) Para 2.34 does not carry any sense to readers who are not familiar with zoological names.	These changes/additions were made as suggested.
Why the Interim Report has been prepared? Is it a TOR requirement or just to meet FAP procedure? An Interim Report may present up-to-date progress of work or may report outcome of analysis on some specific issues or approach. The aim and contents of this Interim Report may be clearly stated in Para 1.1 or 1.2.	Revised in edit.
Inception Report was submitted in April 1993. The Interim report has been dated July 1993. Does it mean that this report presents output of 3 months ?	No. As you know, several revisions of the Inception Report were done, resulting in it being dated many months later than originally intended.
Detailed plans for activities necessary to achieve project outputs have been given. Such details are usually found in Inception Reports. Similarly schedule of activities, work procedure, etc. are also finalised at inception stage. At Interim Report stage any changes necessary in the work programme, study methodology etc. may be reported. This particular reports provides schedules of project outputs, survey methodologies, field data collection procedures etc. Does the proposed programme meet the TOR and objectives of the project? This need to be evaluated and stated.	Yes, we believe the ongoing programme does meet the TOR and objectives of the project. FAP 17 will be subject to a full evaluation during December 1993 and again at the end of the project.
Para 1.5 - I agree on the need of a guideline. At the same time three is need to develop simple (not simplistic) indicators. Para 1.6 indicates that there are constraints in developing such indicators. Even then efforts should be made to translate technical information into simple rules/models/formulae/indicators for future use of planners. Initially such rules etc. may be conservative. These may be refined as more input/data are available.	We will in fact produce simple indicators for the guidance of planners wherever possible. However, in such complex and variable biological systems it will be necessary to conduct an independent fisheries study at the planning stage of each proposed new FCD scheme.

Comments	Replies by the Consultants
Para 2.2 - "The Flood Action Plan (FAP) represents potentially ..... fisheries resources of Bangladesh". This statement is not correct.	Addressed in edit.
Para - 2.3 and Table 2.1 - The impacts refer to the old approach of flood control. Under the approach of "controlled flooding" many of these adverse impacts will be mitigated. The title of Table 2.1 may be modified accordingly.	The changes were made as suggested.
Impact of FCDI projects on fisheries is being studied. Towards this several projects are being monitored (in many of which flood control has been successful). If some projects where flood control component have failed and projects where drainage is main component where studied then a better understanding of impact of the interventions could be obtained.Management of "Jalmohals" may also be evaluated while interpreting impact of FCDI projects on fisheries.	Some of our sampling sites are inside schemes which work poorly, so that we may be able to see a gradation in the effects on fisheries according to how well the engineering structures function. The management of Jalmohals is being studied as part of the socio-economic activities of FAP 17, and the whole question of access to fisheries has been found to be of central importance.
Para 3.34/3.107 - I have doubts about the correctness of the statements made. "Many pond owners rely on passive stocking by fingerlings/fry brought with the flood" - is it true now-a-days?	Changes were made in edit.
Box on Gajnor Beel - Is there any difference between fishing practice between Hindu fishermen and Muslim fishermen. Is there any difference in fishing practice between old days and what is done presently.	Yes, there may be significant differences in fishing practice between Hindu and Muslim fishermen. For example, early indications are that drifting monofilament gillnets are used in rivers predominantly by Muslims. Our socio-economic team is collecting anecdotal information on historical changes in fishing practices from interviews with older fishermen.
Mr. S. Waliullah	
General Comments: - Bibliography and glossary need by appended. Does the term migrants as used here include the whole family or only the earning member or both ?	A glossary has been added. As there were few references cited in this report, they were included as footnotes instead of a separate bibliography.
- Any attempt made by member of the team to walk through the village/s to see and feel for themselves the actual field conditions of fishing communities, canals, beels, ponds, haors etc. ?	Yes, our teams do this at every fisheries site every two weeks and in villages covered by the socio-economic study at regular intervals. This is how our data are collected.
Page 64-65, Table 3.9 The table should be presented in one page for easy reading.	Addressed in edit.

Comments	Replies by the Consultants
Page 67, section 3.81 What about the inclusion of an official of DOF in the teams?	We have DoF staff in all our fisheries teams. Some of our station supervisors are DoF employees. In the socio-economic team it was not considered wise to include DoF employees as this might lead to mistrust on the part of fishermen.
Page 67 What was the reaction of respondents interviewed for three days, in case the same people were selected for three consecutive interviewing sessions ?	Every effort was made to ensure participants were willing to collaborate in the study, and no adverse reactions were reported by our staff.
Specific Comments: Page 45, Table 3.1. Target group approach. How the consultants propose to identify successful NGO? This need be sufficiently explained.	The methodology for identifying successful NGOs has been elaborated further in section 3.182 and following, and in Annex C.
Page 49, O&M, Section 3.2.7 A short review of the concerned population's perception of the whole issue of breeching and public cut should help in the preparation of the project.	We do collect some incidental information on the reasons for public breaches and cuts from local people in the schemes we study, but have not made a full formal study of this question.
Dr. Darrell Deppert, Fisheries Specialist, Panel of Experts.	
General Comments: This report is an improvement over the inception report in terms of substance. It also has more clearly demonstrated the deliverables in the annexes of this report.	
It would have been useful to have seen the methodology design in such detail as has been shown in this report, during the inception phase particularly for the socio-economic study. Our comments at that time might have been useful. This report comes really too late for our comments as the sampling is basically over and comments at this time will be of little value. Consequently I have limited my comments and have not commented on items that could not be changed at this time.	The Inception Report has again been revised to incorporate more details of methodologies.
Page 1, Para 5, The development of guidelines for the assessment of impacts of future flood control measures on fisheries appears to have been given as one of the major outputs ot the study. It is my opinion that this could have been done with considerably less effort and time than what will have been spent in this study. Refer to my comments of the inception of FAP 17.	We felt there was an urgent need for this type of comprehensive and detailed study to provide quantitative baseline data. One of the outputs of FAP 17 will be , in the light of experience, to recommend reliable, but simpler and cheaper methods for use by planners in the future.

Comments	Replies by the Consultants
The interim report seems to indicate that much of the output from the study will be qualitative with little quantification which would of course lead to useful tools for planners of future water projects. There is a lot of ground being covered but the determination of actual indices of fish production in a particular habitat type or AEU will not come out of the work.	If the comment refers to morpho-edaphic indices, as developed for the African lakes, this approach was considered in the planning stage of FAP 17 but considered unworkable in the complex deltaic system of Bangladesh, However, we have measured basic parameters, e.g. conductivity and water depth, which might allow rough estimates to be made. If fish yield per unit area per habitat type is referred to, we do collect these data directly.
On page 42 para 2.84 and again on page 43, para 2.89 it has been mentioned that there is an attempt to extrapolate from the studies sample results to other areas of the country. This was I believe one of the original goals of the study but one which was omitted during the inception phase. Under the planned activities, outputs, and objectives of pages 1 and 2 there is no indication that production estimates tied to flood type or habitat will be used or developed. In the output section the authors are only willing to commit to the production of "guidelines" and have not specified whether they would include production indicators for new areas or not. I feel that the methods for extrapolation mentioned on page 42 should not only be investigated but should be more affirmatively developed.	Yes, you have picked up a basic problem in wider application of our results. When the project was planned, it was believed detailed hydrological information from areas outside those studied by FAP 17 would be available from the regional FAP studies. In fact this information has yet to be generated for the timescale over which our observations were taken. We are liaising with other projects to find a way through this problem as best we can.

Comments	Replies by the Consultants
During the fisheries session of the last FAP conference in May 1993, a number of very significant issues were brought up. Among the most significant was the finding that when an analysis was conducted on the Bangladesh Fishery Resource Survey data a substantially larger countrywide production estimate was arrived at. This was evidently brought about by the reanalysis of a segment of the floodplain catch data which turned out to be much more substantial than earlier thought. In fact the reanalysis had shown that the actual yearly countrywide harvest of fish might be somewhere in the range of 1.2 million tons rather than the previously estimated .8 million. The discussion of this finding and the analysis used to determine this seem to be absent from this interim report. It has been shown as one of the annexes but a summary and discussion of this very important finding could have been presented in the report. I would think that it would be very useful not only to describe this finding but also to present what it means to the FAP planning process. The results it would seem would significantly alter future studies but may also have an impact on some of the past studies.	It is true that FAP 17 staff recalculated DoF FRSS data, taking into account commercial floodplain catches which appeared to have been overlooked previously. However, in view of the perceived unreliability of the raw data, the small size and incompleteness of data sets available, and other statistical problems, the resulting estimates of national floodplain production are still considered doubtful. Therefore until the more definitive production estimates being made by FAP 17 are complete and available for comparison with FRSS data, it was considered premature to recommend revised figures to FAP planners.
Specific comments: Page 18, para 2.47, Will likely be very difficult to determine species of last years fish hatchlings in formalin after determining this years hatchling after some growth in aquaria. May be better to use this years collection only.	Preserved hatchlings will not be grown on! This error has been corrected in edit.
Page 19, para 2.50. The water quality aspects being tested will not tell you much and will not provide an indicator of productivity. Recommendations were made earlier in discussion with FAP 17 team and in comments of Lane and Deppert.	As previously discussed, we were not convinced that a direct link between water quality and fish production could be easily established. We therefore concentrated on actual fish catches, which are in any case the factor of most interest to the people of Bangladesh.

Comments	Replies by the Consultants
Page 42, para 2.84. Hopefully some extrapolation will be possible in conjunction with the surface water modelling center and the GIS work in FAP 19, and that the estimations when extrapolated are of sufficient accuracy to allow for decisions to be made as to whether to go ahead and propose a feasibility for a project or to say no that the fishery is likely to be too important in a given area. In other words to give planners more than they have today as estimates of gross fish production potential and the economic importance of the fishery in the particular area.	Yes, we hope so too (but see above). However, we also recommend that individual fisheries assessments be made at the planning stage of each new scheme, and that fisheries be subsequently monitored using the simplified methods we will recommend.
Page 42, para 2.88. How will the collection of some depth samples at the sampling sites be used to interpret fisheries data in relation to differences in the hydrology. Are the samples that are being taken extensive enough to allow for the establishment of the floodplain area around the sampling site?	We are using our sample measurements of depth and extent of flood at our sites to provide information on timing, duration, and magnitude of the flood inside and outside FCDI schemes. Extrapolation to adjacent floodplain areas might be based on contour maps in the absence of flood simulation models mentioned in answer to a previous question.
Page 43, para 2.90. Agree with continuing surveys until the end of February and getting a full year (which is a must) at all sites.	We will certainly continue until we have a full year's observations at all sites, and for some sites we will accumulate 18 months data (almost fully covering two flood seasons). As one of these years of study was dry and the other wet, we hope to be able to make comparisons on this basis.
Page 45, Table 3.1. In the first row of the table there is a description of the original functions of the village studies and next to this they have shown the revised function. The statement of change given under the revised does not make sense to me and appears to differ quite significantly from the original intention of the study. Also mentioned in the table are resource constraints which should have been foreseen in the beginning or it seems to me that if these areas were important the resources could have been found.	The first sentence of the Revised Function section could be changed to read "Provide data that will allow assessment of the significance to fishing households of changes in the value of fish production due to FCD/I interventions".

Comments	Replies by the Consultants
Page 52, para 3.29. The proposed method for impact assessment on fisheries livelihoods needs further clarification. It is unclear how price data, catch per unit area and changes in flooded area inside and outside will translate into changes in gross fisheries incomes. Particularly how will you know that changes in price data from inside to outside are not due to factors other than say the impact of an embankment. From experience there is a lot of movement of fish from inside out and sometimes from outside in (could be other variables).	It is true that the methods being used may leave uncertainties in some cases, but it was not considered possible to completely re-design the project at such a late stage.
Page 53, para 3.34 and 3.35. The outcome for aquaculture will depend largely on the local availability of fish seed. Even with readily available fish seed there may still be some negative impact on the poorer less advantaged owners who may not be able to purchase fish fry. The Chandpur irrigation project has shown that by bringing the fish seed to the area along with the technical know-how, aquaculture production can be increased substantially. There are of course benefits accruing for the people who have some capital and are willing to take risks.	This is correct.
Page 53, para 3.38. Are not the various facets of the marketing system fairly well known already ? (ie. "Understanding who is involved in fish marketing").	There is an understanding as to the main categories of actors in the system, but not of precisely who is involved in marketing (i.e. are they fishermen, former fishermen, landless labourers etc?)
Page 53, para 3.38. Is the target group approach study to be used for developing methods for possible mitigation of FCD and FCDI projects? If so how will the type of subjective info to be gathered be used to form a guideline for enhanced economic development. Will there be figures which can be attached as possible guidelines on cost of mitigation through this approach.	The output of this study should help the formulation mission responsible for preparation of FAP 17's Phase II activities in identifying models of mitigation costs.
Page 72, para 3.89. The choice of gear as a determinant of whether people are subsistence fisherman will not provide the same results as a survey where you are considering people who practice some form of subsistence fishing. The population is very ingenious at developing ways of harvesting fish without "normal" gear, and secondly as FAP 17 has pointed out they will borrow gear to carry out fishing during periods of need.	Yes, agreed. Perhaps our nomenclature is a little misleading here. For the purposes of sample stratification we classified non-professional fishing households into gear owners and non gear owners. But we have sampled from both categories and will pick up fishing activities wherever they occur. The final analysis need not be on the basis of the original stratification.

Comments	Replies by the Consultants
Page 80. To be able to accurately determine the impact of FAP on aquaculture, there will be a need to monitor the households regularly enough to pick up pond harvests and stocking. From experience, survey form visits do not work very well as people tend to understate/overstate their harvests/stocking of fish. Understating in the case of people who are suspicious or fearful and overstating in the case of those trying to please the person conducting the survey. There may even need to be some actual standing crop assessments made as reality checks or actual sampling surveys/observations done daily during random periods throughout the year.	There is a problem here, but the solution proposed is not considered realistic.
Page 105, Target group approaches. One of the outcomes of this exercise should be some guidance to FAP and future water planners as to what extent they can use the NGO target group approaches to mitigate future damages through investments in this area.	Correct. In fact the study will be used also to help design the second phase of FAP 17's activities.
Appendix I, Activities. There is a need to include in the subsidiary output column along with the assessment of exiting catch data of FRSS that the database should be provided to the Department of Fisheries. Under principle output there should be an item which will address the studies finding with regard to potential mitigation measures as established during the existing study.	As discussed in answer to a previous question, the DoF FRSS data will be re-assessed in light of the results produced by FAP 17. Consultations between the project and the department continue regularly.
Dr. A. L. Sarker	
General Comments: An Interim Report does indeed demonstrate the extent of progress in the implementation of a project. It records the outcome of approach/methodology followed to accomplish some specific objectives. The present report details plans and field methodologies on many aspects of the TOR which should have been done in the Inception Report. Many of the activities as required in the TOR, such as design of catch assessment and socio-economic survey form, the programme for determining production indicator (analytical steps), formation of data base on fish biology and species composition, appraisal of the existing conditions and the requirements of the flood plain fishing communities etc were put off till the Interim Phase.	The Inception Report has again been modified to include more details of methodologies.

Comments	Replies by the Consultants
The present Interim Report provides an appendix showing the activities and work schedule which does not include, in the way it should, some of the important objectives such as Fish Stock Assessment, assessment of FCD/FCDI influence, prediction of the nature and magnitude of FC interventions, assessment of socioeconomic issues/change, development of engineering and fisheries management measures for optimising the negative effects, TOR preparation for the pilot projects, etc. etc. Nevertheless, the present report documents tangible progress in the implementation of the project.	It was felt by the FAP 17 team that the tables of activities and outputs given in the appendices of the Interim Report do in fact cover all the areas of work mentioned with the exception of the terms of reference for the formulation of pilot projects, which were given in Appendix II of the Inception Report.
Specific Comments: Section (Introduction) Para 1.2 (Appendix I), p.1. In the project schedule as given in Appendix I, selection of regions stands out to be the first activity. When the regions are already recognized and the FAP 17's study is national in scope, there is no justification for such a selection job which find no place in the list of activities.	True, regions were already identified. However, selection of schemes and sites took considerable time.
Section (Introduction) Para 1.2 (Appendix I), p.1. The work schedule shows completion of field station establishment by December 1992; but as far as I am aware, establishment of the station in the SW is yet to be finalized.	The station established in the SW region is at Madaripur. The questioner is referring to the disagreement over the siting of this station, and in particular over the issue of whether FAP 17 should have become involved in sampling brackish water sites in the SW. This issue forms the basis of many of the questions below, and is discussed further there. However, it must be appreciated that, at this late stage, further argument over this question is not helpful to the target of producing timely outputs from Phase I of FAP 17.
Section (Introduction) Para 1.2 (Appendix I), p.1. As required in the TOR, the FAP 17 study and Pilot Project will be national in scope covering the five regional studies of the Flood Action Plan (FAP), but a very important fisheries region - the SE is missing from the list of the regions in the appendix under Fisheries Surveys and Hatchling movement studies.	This question continues the above controversy, extending the argument to the SE region. As far as FAP 17 staff are aware, it was never agreed that the project would cover all FAP regions.

Comments	Replies by the Consultants
Section (Introduction), para 1.4, pp.1-2. The important objectives as restated here do not include the study of shrimp production in selected flood plain water resource systems influenced by FCD/I activities. This is one of the very important activities to be carried out under the FAP 17.	Again this comment refers to the controversy over brackish water areas. It has been explained a number of times by senior ODA staff that these areas were left out of the study due to lack of resources. Including them would have necessitated working in ecosystems and with species which are different from all the other regions in which FAP 17 operates. The project is, however, looking at inland prawn production, distribution, and the effects of FCDI schemes on them. We are also working with Chittagong University to expand this area of study through further identification of species. This activity forms the basis of several MSc studies.
Section 2 (Impacts on Fish), para 2.1, p.3 Much of the information have been stated to have been inferred from studies carried out elsewhere in the world because of data scarcity in Bangladesh. The data collection programme especially from the primary sources could be good enough in formulating a custom designed index for Bangladesh.	We hope by the end of the project to have enough information for Bangladesh, but at the beginning of the study this was not available and we therefore referred to overseas sources.
Table 2.1 (Possible Impacts...), p.6. The aspects affected should include the nutritional aspects of the fishing community as a whole.	These aspects are being covered by the socio-economic part of the FAP 17 study.
Section 2, Subsection (Sampling Sites), para 2.14 to 2.16 p.7 Table 2.2 has enlisted schemes under different project types - FCDI, FCD embankment along with main river, FCD nonmain river, submersible embankment and empolderment in semisaline zone. This list has covered 4 regions excluding the SE. Another project type "Flash Flood Rivers canalized by embankments" very often encountered should be undertaken in Mymensingh (NC) and Feni (SE).	We accept that there has not been complete coverage of geographic area or types of flood control engineering intervention. We concentrated on what we felt were the most important types of flood control.
Section 2, Subsection (Sampling Sites), para 2.14 to 2.16 p.7 The sample sizes of the FCD and FCDI types look to be somewhat alright; but those of the other types do not look to be quite representative. FAP 12 (FCD/I Agricultural Study) evaluated the impacts of a total of 18 completed projects. In the present study, the number of schemes under each of the 6 (six) project types could possibly be three (2 will be alright in exceptional cases).	We would ideally have liked to cover more replicates of each type of scheme, but were limited by time and resources.

Comments	Replies by the Consultants
Section 2, Subsection (Sampling Sites), para 2.14 to 2.16 p.7 Appendix VII of the Inception Report as referred to, in para 2.16 has given the locations of the sampling sites in all the regions but the SER. The Consultants' reply to our comments on this exclusion of the SER is not based on fact. The SER has never been and can never be removed from the project schedule. In fact, we agreed to omit the field station planned for Chandpur in the said region, because the Consultant was reluctant to establish any station in either of the two important fisheries regions - the SW and the NE and because there has been a Fisheries Research Station in Chandpur where facilities exist for data collection and analysis.	This again refers to the "SE and SW controversy". Regardless of whether the statements made in this comment are accurate or not, it must now be accepted that it is too late to change the project design at this stage, or to extend FAP 17's Phase I activities into new areas. However, it is hoped that the SW region will be included in Phase II of the work.
Section 2, Subsection (Sampling Sites), para 2.14 to 2.16 p.7. The Consultants' replies to our comments on Appendix VII as given in the Appendix IX and X of the Inception Report are not acceptable. The SE region was never removed from the schedule as clarified earlier. The Appendix VII should, therefore, include this region and sites (as many an 30) selected at open water capture fisheries in rivers, perennial beels and seasonally flooded land both inside and outside FCD/I project schemes. It should also indicate how and when the FAP 17 data will be made available to other FAP studies.	The previous answer also applies to this comment. FAP 17 data is available to other FAP projects at any time. Processing and interpretation of data will be completed by the end of April 1994.
Section 2, Subsection (Field Survey), para 2.17, p.8. To assess the effect of FCD/I schemes on fish production, a number of surveys have been planned and conducted at sites inside and outside the flood control schemes. How about such field surveys on shrimps production?	As previously stated, marine shrimps are not included in Phase I of FAP 17. However, we are studying freshwater prawns, though not in such taxonomic detail as the fish.
Section 2, Subsection (Field Survey), para 2.17, p.8 Appendix II includes too many survey forms on Fisheries and Socio-economics. Are they all going to be utilized within the life span of the project? And if so, how and when are the data going to be analyzed for accomplishing the specific objectives of the projects? Are all the survey forms designed for the NC region?	Yes, all the forms are being utilized. Analyses of data are currently underway, and we expect to produce conclusions on schedule during the first half of 1994. All survey forms are the same for all regions. NC forms were included as examples in the report.

Comments	Replies by the Consultants
Section 2, Subsection (Field Survey), para 2.17, p.8 How about the data on brackish water fish/shrimp production, beel fish and pond fish production?	Beels are included in our surveys. Some aspects of pond fish production are being covered in our socio-economic work, especially NGO target group approaches to aquaculture. Pond aquaculture will almost certainly form part of FAP 17's Phase II activities.
Section 2, Subsection (Field Survey), para 2.17, p.8 How about the data on distribution and production capacities of the hatcheries and the nurseries? and how about the Fish Migration Record Format?	Hatcheries and nurseries have not been covered, as Phase I of the project is designed to study wild fish populations. There is no specific form for fish migration studies, but the biologists collect information direct from fisheries, and findings are included in the monthly reports from the supervisors of field stations.
Section 2, Subsection (Field Survey), para 2.17, p.8 When the Consultant could afford to design format about 100 pages for survey work, we fail to understand why it would not be possible to include the most essential set of variables such as the main drainage, water supply: degree of flooding, pollution, use of water, fishing, spawning ground, predators, temperature, salinity, plankton samples and other natural food etc. in the water quality survey form.	Though not all these parameters are covered by the water quality survey form, most (i.e. drainage and water supply, degree of flooding, fishing, spawning grounds, temperature) are covered in other documents.
Section 2, Subsection (Species list), para 2.24, p.10 Appendix IV gives a list of the fish species by regions but omitting the SE. While offering comments on the Inception Report, we made some suggestions to include some information on species being threatened and on those that have already become extinct. Common names and local names need also to be recorded so as to enable all readers to identify the fish species. The list should include over 100 more fish species and at least 17 more prawn/shrimp species that occur in the inland waters of Bangladesh. So the species list should be revised.	We agree common and local names are very important, but have had problems collating these. We expect to produce a definitive, revised list of fish and prawn species, including local names, in the final report.
Section 2, Table 2.4, 13-15 (Species List) Generic names of some of the species have been split in the list. This is not acceptable in a scientific report.	This is regrettable, but was caused by shortage of space across the tables to accommodate long generic names.

Comments	Replies by the Consultants
Section 2, Subsection: Fish Movement, paras 2.43-2.48, pp.17-18. What methodology was followed or special surveys were conducted to monitor the drift of hatchlings and to investigate the effects of regulators on hatchling number and densities as well as to assess the effects on fish recruitment?	Savar nets made of mosquito netting were used. These were set at various depths and positions across rivers to evaluate position of hatchlings in the water column. Measurements of current allowed conversion of timed catch rates into estimates of fish density and number. Fish were caught on each side of the regulators, allowing estimates of density, numbers and mortality (if any) on each side of the structure.
Section 2, Subsection: Fish Movement, paras 2.43-2.48, pp.17-18. No methodology has been indicated for fish movement study.	Hatchling movements were studied as described in the previous answer. For adults we do not have a field methodology. We look at changes in catch composition between linked habitats to infer movements of fish.
Section 2, Subsection: Catch Composition, para 2.65, p. 25. Species composition inside the outside the Tangail CPP has been studied. How about the data for the other regions?	Tangail was used as an illustration of the type of analyses which are being done at all regions.
Section 2, Subsection: Fry/Hatchling Movement, para 2.70 and following, p.30. The Consultant should provide the fish egg, fry and hatchling collection centres in Bangladesh by indicating them in Figures and refer to the previous studies made on this aspect.	This work is routinely done by DoF, and such information will be used in the production of the final conclusions and report of FAP 17.
Section 2, Subsection: Fry/Hatchling Movement, para 2.70 and following, p.30. There were as many as 5 carp fry collection centres in the Baral river area. The impact of the Charghat regulator on the fate of these centres must be known. since the studies on the Charghat regulator started late and missed the July floods in 1992, we are looking forward to seeing the results of 1993 studies in the upcoming revised Interim Report.	We will include the results of 1993 studies on Charghat regulator in the final report.
Section 2, Subsection (Fish Population Dynamics), paras 2.76-2.79, p-36. A noticeable difference between the length frequency distributions inside and outside the CPP was observed indicating negative effects of flood control interventions on the populations of *Puntius sophore*. Although the length frequency method has failed to separate reliably the older age groups because of increasing overlap in length distribution, the Consultant should work on a number of species at different regions. In the present study has been restricted to the CPP area only and on only one species of one region.	This work is being done on a number of species in several regions. *Puntius sophore* in Tangail CPP was merely used as an illustrative example.

Comments	Replies by the Consultants
Section 2, Subsection Future Programme, Paras 2.90-2.91, p43. The future programme must include all activities in the SE and the SW regions.	The SW and SE controversy has been discussed above.
Section 2, Subsection Future Programme, Paras 2.90-2.91, p43. The Consultant should link their FAP 17 studies to other FAPs namely the FAP 12, 13, 14, 15 and 23 in addition to what they have collaborated with, as well as to other organizations (BFCD, BWDB, FRI) and departments (DoF, DoE) for better subsidiary outputs.	We do consult/liaise with other FAPs whenever possible.
Section 2, Subsection Future Programme, Paras 2.90-2.91, p43. The future programme must provide data base on aspects of natural history and ecology (life cycles etc.) habitat needs and fishery management issues on at least 10 species of over 260 fish species and 20 prawn species that occur in the inland water of Bangladesh.	We will be able to infer a lot about the life cycles of at least 10 important species from our routine studies of distribution, reproductive state, hatchling movement etc., together with feeding studies (stomach contents analyses) now under way in NC, NW and NE regions.
Section 2, Subsection Future Programme, Paras 2.90-2.91, p43. The programme should form a database on fertilizer use and other causes of degradation of water/soil, both natural and man made, for enhanced management of fisheries.	This is outside the scope of our work.
The future programme must also not lose sight of the following, in additional to what is has, in the schedule:	
a) A study of shrimp production accompanied by an evaluation of migratory movements, assessment of the effects of controlled flooding and provision of engineering and biological management measures for optimising the adverse effects.	We are doing this for freshwater prawns, but not for marine species.
b) Assessment of the socioeconomic changes on populations engaged in fishing and related activities with special attention to -	
i) fish marketing, transportation and distribution networks;	i) A special study of fish marketing systems, margins, people involved etc. is being done as part of the socio-economic programme.
ii) institutional and patronage hierarchies through which access to fisheries, credit and alternative/complementary resources etc. are controlled;	ii) This is also being done by the socio-economic team of FAP 17.

Comments	Replies by the Consultants
iii) a special socioeconomic study to assess the effects of FCD/FCDI projects and of private water resource exploitation on capture and culture fisheries.	iii) This is one of the main functions of our work.
c) Impact of not only flood control measures on pond aquaculture but also of irrigation projects - increasing withdrawals of ground water for irrigation, water withdrawals from standing water bodies during the dry season;	Increasing withdrawals of ground water are important, and the relationship between this and the extent of dry season water bodies requires study. We believe dewatering of dry season (perennial) water bodies is bad for fisheries.
d) Impact of irrigation projects - abstraction of surface and ground water - on the open water capture fisheries production in the 5 different regions of Bangladesh.	We agree this would be a valuable field for investigation, but we have not covered it.
e) Studies and research on the breeding biology, migration patterns, feeding grounds and spawning areas and the passive drifts of fish hatchlings and fry etc., as omitted; and	This is being done, as described in answer to previous questions, but requires a lot more work.
f) All mitigation measures detailed and costed.	Mitigation measures to be tested as pilot projects in Phase II of FAP 17 activities will be costed.

SECTION 4

Comments of PoE on the Draft "Fish Friendly Regulators" technical paper, which was subsequently revised and re-submitted as Annex A to the Interim Report of FAP 17.

Comments	Replies by the Consultants
Comments on the "Fish Friendly Regulators" technical paper. General note Regrettably, this paper was given to FPCO for comments prematurely, while still in a rough draft form. The document has since been heavily modified and edited by FAP 17 staff, and the revised version is now included in the Interim Report as Annex A under the title "The Use of Passes and Water Regulators to Allow Movements of Fish through FCD/I Structures". The comments on the first draft received from FPCO were in almost every case considered reasonable and correct by FAP 17, and have been taken into account in edit where possible. However, since the report was based on the work of two expatriate engineers, who are no longer in Bangladesh, it is acknowledged that certain technical queries may not have been addressed as fully as existing FAP 17 staff would have wished, due to lack of in-house specialist engineering expertise.	
Comments by Mr. Huda:	
The report contains theoretical part only	Yes, the report is largely intended as a background technical paper. Practical recommendations on operation of engineering structures will be strengthened when the results of FAP 17's studies on fish migration etc. are complete.
The team did not consult with the local Engineers who are now designing various structure of FCD/I projects in Bangladesh. The proposed structures must meet the requirements of Bangladesh Project Condition.	The team did consult other FAP engineers, especially those of FAP 20 (who were engaged in designing regulators at the time of our consultants' visits).
The team should discuss with different FAP Study Teams in order to have an idea of the proposed structural interventions for different FAP Projects.	Discussions were held with other FAP teams, and more will be when further data from FAP 17 studies on fish migration etc. are complete.
The difference of Water-levels between inside and outside of the regulators/structures are not much and as such the hydraulic conditions of the structures may be easy to accommodate the requirements of fish. The movement of fish takes place in two direction pre-monsoon and post-monsoon.	We agree that in many, probably most, cases no special structures will be needed, but rather that operation of existing structures needs to be modified and organized in such a way that fish are allowed to pass. However in the NE, where head differences are bigger, special structures may be needed.

Comments	Replies by the Consultants
The guidelines should cover separately a) for - Major river to flood plain - Major river to Medium/Minor river - Khal, channels - Flood plains - Haors and beels b) and for major embankment, submersible embankments c) Small fish and big-fish d) To meet the conflict in maintaining the water levels for agriculture and fish. e) The fish passage structure is to be cost-effective.	We agree with all this. FAP 17 will provide guidelines as fully as possible when our studies are finished and analysed.
Page 16, Appendix - IV - The regulator should named as Lohajang regulator as named by FAP -20. The BWDB design office is designing this regulator. As such the FAP 17 team should discuss with design office at Dhaka and the Project Office at Tangail. This will help in finding out a probable suitable fish friendly structure. They should provide criteria for operation of the gates.	FAP 20 was consulted by our engineers. Guidelines for gate operation will be given after completion of fish movement studies.
Para 3.4, page 22 - The modification of small structure for fish movement may be looked carefully as those might be required to be modified or a suitable side structure for fish passage.	General guidelines for modifications will be produced, in addition to specific recommendations for the regulators we have studied. However, we have clearly not been able to monitor the operation of every individual regulator, but have covered what we regarded as representative examples.
Some pilot structure may be built in some FCD/I project under FAP 17 project in consultation with BWDB and other FAP regional Study Team.	It is anticipated that the second phase of FAP 17's activities, which is now under planning, will include either construction of a specially-designed structure or at least modifications to the operation of existing structures to enhance fisheries.
Appendix V, page 38 the large structures as shown in this appendix are not necessary. The team may give example and drawings for structures which are expected to be built under FAP projects.	We agree that in most schemes large structures are not needed. They were included in the report by the consultants to complete the coverage of the subject. Exceptional cases where large structures may be needed in Bangladesh might be the potential barrages on the Ganges and Jamuna. In most cases in this country special structures will not be needed, but operational schedules will need to be planned to allow passage of fish at appropriate times.

Comments	Replies by the Consultants
Appendix - II - Regional Appraisal of Migratory Patterns - This appendix shows examples Africa, South America, Asia. But these are very scanty for any conclusion. Moreover, movement characteristics of different varieties of fish available in Bangladesh like - Prawn, Sea-fish, Hilsha, Sweet-water large and small fish are to be covered.	Regrettably, as information on the migrations of Bangladesh fishes, their swimming performance and capabilities etc. is scarce, this was inevitable. Examples were therefore drawn from other regions to demonstrate the principles. Some further information on native species is being produced by FAP 17.
Comments by Dr. A. L. Sarker:	
Section 2 (Introduction), subsection, para 2.9, pp.4-5 The TOR of FAP 17 Fish Passes would have been more appropriate here rather than those of the Hydraulic Engineer. The rule in writing any technical document is, to put down the objectives first. Although the Hydraulic Engineers TOR as laid down look alright, they are not in full agreement with those of the project. As required in the TOR for Fish Passes, the FAP 17 project should review the impact of Water control structures, especially control gates, on the movement of fish. This review should consider the seasonal pattern of gate operation in relation to the seasonal migration of fish between rivers and flood plains. The project should assess the extent to which fish movement is impeded or enhanced and indicate the scope for modification in design and operation of the regulators. The project should provide the most appropriate designs for fish pass structures considering the engineering, biological and social implications.	The report is based on the findings of our consultant engineers, and that is why their terms of reference were originally given. They have been edited out of the final document. The report is intended as a background technical paper only, not as the final word of FAP 17 on water control structures and fisheries. Further information and practical recommendations will be made available later when the studies are finished. The project is studying the extent to which fish movement is impeded by regulators etc.
Section 4 (Potential Impacts...) Para 4.1, p.7. The FAP 17 project as required in the TOR, should assess the influence of FCD and FCDI schemes and other flood control measures on hydrological biological and water quality conditions relevant for fish production. It should have studied the impact of the existing FCD/FCDI projects to predict the nature and magnitude of the effects of flood control interventions upon capture fisheries. It does not seem to have done these review but states that the evidence is fragmentary.	These things are being done by FAP 17.

Comments	Replies by the Consultants
Section 6 (Fish Migration), paras 6.2-6.3, pp. 14-15 Evaluation of migratory movements and location of spawning grounds etc. were some important aspects of the present study. Migration has been discussed at length but without any evaluation of such activities on our major fish species of commercial or environmental significance. Knowledge of the spawning migrations of major carp and Hilsha as well as of lateral migrations of the flood plain dependent fish species including those of the riverine hatchlings are indeed of outmost importance for proper design and construction of the Fish Friendly Structures. The exact dates of lateral movements (both passive and active) of different fish species from the rivers to the flood plains and vice versa should be known.	Fish migration is being studied by FAP 17, and results will be presented in the Final Report.
Section 6 (Fish Responses to Currents) Para 6.7 - 6.9, pp. 15-16. The hydraulic design of fish passes incorporated in drainage regulators should take into account the fish's swimming ability. The migration capacity of a fish, no doubt depends on the swimming ability of the fish through the structure as well as on the acceptable density of fish within a pool during ascent. The swimming ability and fish responses to current have been well covered but nothing has been stated about the acceptable density of fish (carp and catfish) of different sizes in a proposed fishway at particular depth. A poorly located fish entrance which is avoided by or delaying the migrants could reduce the theoretical capacity numbers. Conversely good location and alignment choices could possibly improved the capacity.	There is little information available on "acceptable fish density" in passes, and none for local species. Yes, as pointed out in the report, the location of the fish pass entrance is very important.
Section 13 (Conclusions) Para 13.4, p. 36 A narrow structure lacks operational flexibility and increases energy dissipation problems downstream. The question is how wide should be the gate and how should it be determined?	From the fishes' point of view, the wider the better provided, in the case of upstream migrants, that sufficient water velocity is maintained to attract the fish. Actual width depends largely on the volumes of water the engineers calculate needs to pass.

Comments	Replies by the Consultants
Comments of Dr. S. S. Abedin:	
General The hydraulic phenomenon of the over shot, under shot and retracted gates (Fig.7, para 21) as suggested are reasonable. But the arrangement of the fish friendly structures as suggested are mostly oriented about the flushing regulators e.g. the Lauhajanj regulator in Tangail where the flow is one directional - from river to the polder. There should be a clear distinction between a flushing sluice and a drainage sluice. In a flushing sluice, under the conventional practice in our FCD project, the flow is restricted just to meet the requirement of flushing (predominantly to meet the crop water requirement). So that there is less rise of water level inside the polder. In this case the over shot gates, double gates and side gates as suggested are reasonable.	It is true that the report concentrates on flushing regulators. The work the project is now doing is covering both types of regulator, and FAP 17 will make recommendations for allowing fish passage through both types.
In case of the drainage sluice or a drainage-cum-flushing sluices, under the conventional practice, the gates are full open (retracted flow Fig. 7) during the pre-monsoon and post-monsoon periods. The gates are fully closed during the full monsoon. Therefore it appears that over shot arrangement during the full monsoon would meet the requirements both for the fishes and agriculture. Over shot gates will have less depth of water. i.e. less inflow into the polder. This will minimise rise of water level within the polder but help fish movement. To achieve this a movable weir type would have been probably the best solution. But its problem in application in a drainage channel is the possibility of silting up the recessed groove. An alternative to this is the bottom hinged gates as conceived in this Gumti Phase II Project (1993). The consultants are suggested to go through the report and may look for its suitability.	Alternative proposals will be considered, and discussions can be held with engineers when further information on fish movements is available.

Comments	Replies by the Consultants
Detail Comments Page 4, Section 2.5, 4th line. It is said that the benefit of the FAP will be on agriculture, not fisheries. The expression may be correct but the question is what is the alternative? Can the nation sustain both in respect of food production and other economic growth without flood control. There should a compromise of the two: agriculture and fishery. Also other benefits of FAP: economic and human life etc. There have not been mentioned here. Anyway to achieve sustained growth both for agriculture and fishery there should be a national budget for allocation of area for the two. So that the area reserved for fishery may be safeguarded from any FAP interventions. For equity the reserved area for fishery may be distributed over the entire country.	These are the observer's opinions. They are noted with interest.
Para 6, section 3.6 a) MPO was under the Ministry of Irrigation, Water Development and Flood control and not under the BWDB. b) Duration of flooding for F1 land is very short. May one month or less. Therefore, its contribution to fishery is questionable. c) Area under full flood control does not eliminate flood over 100% of the area but creates a condition for protection against flood damage and increases the cropping intensity. The statement therefore deserves to specify the extent of land that is going out of flooding and the duration. Otherwise this may confuse the readers.	(a) Corrected in edit. (b) Even though short-lasting, shallow flooding is important in providing breeding and nursery grounds, and therefore has significant impact on the fishery as a whole. (c) This section has been edited out of the final document.
Page 6, section 3.7 It is stated that the seasonal flooding is mainly by rainwater ponded on land where drainage is impeded. But actually major cause of flood in the country is the water carried by the cross country river (93% of the catchment is outside the country), Therefore the expression may be corrected.	Changed in edit. It is true that both sources of flooding are important.

Comments	Replies by the Consultants
Page 6, Fish in the rural diet A section may be added here discussing the rate of decreasing the percapita fish consumption in the rural diet and the reason behind this. The main reason for decreasing the fish production in the recent past is probably over fishing and siltation of beel areas and may not be flood control. Until now there are very few FCD projects which are 100% effective. This aspect are suggested to be studied adequately.	Yes, there are many reasons which may be collectively responsible for the perceived decline in fish production. Many of these are beyond the scope of our studies, which are designed to show the effects of FCD/I schemes by comparing areas inside and outside embankments.
Page 7, section 4.1 It is agreed as stated in this section that Flood Control does have an impact on fish production. But then is there any other solution for sustained food production and economic development. A national land use budget in this connection is probably desirable. The budget may identify areas reserved for agriculture and fishery. No FCD may be developed in the area reserved for fishery.	This is one approach to the problem which is worthy of further consideration.
Page 7, section 4.2 It is said that embankment of any kind will inevitably disrupt fish movement to some degree. This general remark may need further elaboration. Embankments are normally by the side of the rivers which are at high ridge. There are many rivers whose banks are not submerged before June. Therefore the disruption of fish movement over the banks are limited only after June. On the other hand as suggested elsewhere in this report major movement of fish toward the flood plain is upto June.	Normally actively migrating fish would move into smaller waterways to gain access to the floodplain. Blockage of canals etc. by regulators has impeded this movement.
Page 20, section 7.7 2nd line "free flow" may be replaced by "shot" to justify the statement in the 3rd line "discharge rises in proportion to the root of upstream head"	Corrected in edit.
Page 21, section 8.1, 1st line What is "freshets"?	A "freshet" is a rapid rise in water flow in a stream following rain. In context it referred to early showers coming before the full monsoon.

Comments	Replies by the Consultants
Page 21, section 8.2 It is stated that fish will not be attracted as the flow is towards the polder It may be noted that in most of the FCD project the flow is towards the river during the pre-monsoon period (upto end of May/June) when there is maximum movement of fishes as stated in section 8.7 (3rd line).	This is generally true, but there are instances where current flows the other way. The text was modified in edit to put the statement into context.
Page 23, section 8.9 2nd line During the early stages of flood cycle river water remain lower than the representative ground level inside the polder. Therefore, normally excess run-off flows out of the polder. This may be noted and the sentence may be modified or deleted accordingly.	Changed in edit.
Page 25, section 8.11 From this and preceding sections it appears that the consultants are yet to develop their concept about the cycle of flood water movement in a FCD project. In the area outside the tidal influence, normally the river water level during the pre-monsoon period remains below the polder water level and thereby water flows out. At this time the drainage regulators are full open. (Free flow condition). River water level rises faster there after during the full monsoon. The gates are then closed under the present practice to prevent inflow of water. Only at this time the operation and design of the gates need to be modified for fish movement. River water level recedes faster, again, at the recession of monsoon. The gates are either fully or partly opened for controlled drainage. In the flash flood area and Haor areas above phenomena many however not be entirely correct. The consultants are suggested to study the above remarks and modify their remarks and suggestions accordingly. The hydraulic phenomenon in regular as suggested may be applicable for flushing sluices only.	These remarks are correct, and changes were made to the text during revision.

Comments	Replies by the Consultants
Page 32, section 9.5 It understood that FAP 17 is going to monitor the regulator at Charghat to study the interaction of regulators and fish fry. But Charghat may not be a representative structure. The general slope of the area behind the structure is away from the Ganges/Padma river. Therefore, the flow mostly one directional - towards the country side only. The representative regulators for study should be the Talimnagar at Pabna, Zia Khal Regulators in the Noagaon polders or the Bera regulator. These are drainage regulators while the Charghat regulators may be considered as a predominantly flushing regulator. Same is the case with the Lauhajang Regulator (Ref. Section 10).	We are studying several regulators including Charghat, representing both flushing and drainage structures. These include Talimnagar at Pabna and Bauitara on the Brahmaputra right embankment.
Page 34, section 12.1, 12.3 The flows condition under the retracted gates as suggested are possible and are being practiced in case of drainage regulators both during the pre-monsoon and post-monsoon periods. During the monsoon period normally the gates are closed under the present condition. To make those fish friendly the outer two vents may be arranged over shot as suggested in section 12.3 In case of flushing sluice like the Lauhajang or the Charghat the arrangement should be as suggested in section 12.3	This is one feasible solution, which is now included in the report text.
Page 35, section 12.6 Lifting gates recessed into the sill as suggested here and in Fig. 16(b) may not be effective as the recessed groove is likely be silted up and needs frequent maintenance which is difficult specially where it is underwater. A bottom hinged gates as proposed in the Gumti Phase II report (1193) may be consulted.	This suggestion is very useful, but the recommendations of Gumti Phase II were not available to our engineers when they were in country.
Other suggestions for improving the report not mentioned above were welcomed, and have been incorporated into the final document.	