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FAP-16

BANGLADESH FLOOD ACTION PLAN



**WORKPLAN:
FAP 16 ENVIRONMENTAL STUDY - PHASE IV
February 1994 - April 1995**

ENVIRONMENTAL STUDY (FAP 16)

FAP-16
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Prepared for

The Flood Plan Coordination Organization (FPCO)
of the
Ministry of Irrigation Water Development and Flood Control

April 1994
(Revised, May 1994)



IRRIGATION SUPPORT PROJECT FOR ASIA AND THE NEAR EAST
Sponsored by the U.S. Agency for International Development

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IRRIGATION SUPPORT PROJECT FOR ASIA
AND THE NEAR EAST

ISPAN Technical Support Center
Room 1001
1611 North Kent Street
Arlington, Virginia 22209-2111
USA
Phone: (703)243-7911
FAX: (703)525-9137
TELEX: 276532 ISPAN UR



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ACRONYMS

ADB	Asian Development Bank
BAU	Bangladesh Agriculture University
BDG	Bangladesh government
BUET	Bangladesh University of Engineering and Technology
BWDB	Bangladesh Water Development Board
CPP	Compartmentalization Pilot Project
DOE	Department of the Environment
EIA	Environmental Impact Assessment
EIP	Early Implementation Project
FAP	Flood Action Plan
FCD/I	Flood Control, Drainage, and Irrigation
FPCO	Flood Plan Coordination Organization
GIS	Geographic Information System
IEC	Important Environmental Component
IEE	Initial Environmental Examination
IMED	Implementation, Monitoring, and Evaluation Division (Ministry of Planning).
IPSA	Institute for Post-Graduate Studies in Agriculture
ISPAN	Irrigation Support Project for Asia and the Near East
MIWDFC	Ministry of Irrigation, Water Development, and Flood Control
MOEF	Ministry of Environment and Forest
NGO	Non-Governmental Organization
PATC	Public Administration Training Center
PER	Preliminary Environmental Review
TOR	Terms of Reference
TOT	Training of Trainers
USAID	United States Agency for International Development

Chapter 1

INTRODUCTION

Following severe floods in 1987 and 1988, the Bangladesh government (BDG), with the active cooperation of the World Bank, created the Flood Action Plan (FAP). The stated purpose of the FAP is "to investigate options for reducing damage caused by floods in Bangladesh and to set the foundations of a long term program to meet Bangladesh's objective of achieving a permanent and comprehensive solution to flood control in reducing the risks associated with economic activity on the flood plains and increase the economic growth rate of the country."

1.1 Environmental Study (FAP 16)

The Environmental Study (FAP 16), one of the 26 components of the FAP, is a supporting study that provides input to the FAP regional and subregional studies. FAP 16 is needed because the construction of embankments and modification of natural flooding regimes, combined with intensification of agriculture and expansion of infrastructure in flood protected areas, could have adverse impacts on soil productivity, fisheries, public health, groundwater recharge, wildlife, plant diversity, etc. This study therefore is an integral part of planning flood control projects, undertaken so that adverse environmental impacts are mitigated or avoided, as far as possible, in the design, execution, and operation of FAP projects. Long-term environmental impacts will also be monitored to identify adverse trends and propose realistic and appropriate remedial measures. The study covers all the regions of Bangladesh as identified in the FAP.

The FAP 16 study team works in close consultation with the Flood Plan Coordination Organiza-

tion (FPCO) and with other FAP studies, especially the regional studies (FAPs 2-6), Town Protection (FAPs 8 and 9), FCD/I and Review (FAP 12), the Land Acquisition and Resettlement Study (FAP 15), and the other USAID-supported studies: Flood Response (FAP 14), Geographic Information System (FAP 19), and Flood Proofing (FAP 23). Advice is provided to other FAP studies as needed and as time permits. Some of the resources needed to undertake the study are shared with other USAID-supported studies.

In addition to the FPCO, FAP 16 also maintains effective technical liaison with other BDG ministries and agencies (such as the DOE, BWDB, WARPO, BUET, SPARRSO, BADC) as well as relevant donor experts to minimize duplication and to provide mutual support. The institutional support of BWDB, DOE, WARPO, BUET, LGED, and other government agencies not only improves the quality of the study output, but also develops cooperation, coordination, and understanding among the institutions. The FAP 16 team periodically reviews and incorporates into the study guidelines and policy papers relevant findings and recommendations from the activities of international donor agencies such as UNDP, ADB, CIDA, and the World Bank.

Knowledge of local and expatriate consultants with experience in the field of environmental studies are shared through the direct involvement of local officials in the formulation of the project. In addition to providing input to the FAP regional studies, FAP 16 works to develop local expertise in environmental studies by providing technical training, both abroad and in-country, for local officials.

1.2 FAP 16, Phases I-III

FAP 16 was initiated in November 1990, but because of the Gulf War, all USAID-sponsored studies were suspended. Since the study effectively started April 1, 1991, it has completed three phases and is currently in its fourth phase, which is due for completion in April 1995.

Phases I and II: April 1991-September 1992 (18 months). The tasks described in the original Terms of Reference (TOR) included formulating a set of guidelines for Environmental Impact Assessment (EIA), completing a users' manual for EIA, undertaking three EIA case studies, and completing five special (applied research) studies on a variety of subjects of relevance to environmental management in flood control projects.

Phase III: October 1992-October 1993 (12 months). Additional tasks specified for completion during this phase were: EIA training, in particular, external training for FPCO, DOE, and BWDB personnel; and extending the original Charlands Study (which only covered the Brahmaputra-Jamuna) to include the Ganges, Padma, and Meghna rivers. These were defined in the extended program for FAP 16, approved in Project Implementation Letter (PIL) #2 dated October 7, 1992, and signed by the government of Bangladesh on December 13, 1992. These activities were completed on schedule and included two EIA skill training workshops for local EIA practitioners, a series of seminars on environmental management for senior BDG civil servants, and a draft paper on the institutionalization of the EIA process in Bangladesh.

1.3 Objectives of Phases I-III

Phases I through III had seven objectives:

1. Identify environmental issues through a review of available literature and studies; consult with flood control project planners; and conduct field visits to completed flood control and drainage projects and proposed project sites.

2. Prepare guidelines and a users manual for Initial Environmental Examination (IEE) and EIA in regional and feasibility studies of Flood Control, Drainage, and Irrigation (FCD/I) projects for use of FAP projects.

3. Assess the likely environmental impacts of flood control projects and develop recommendations so that the adverse environmental impacts are avoided, as far as possible, in the design, execution and operation of the project under the FAP; conduct EIA case studies to develop and test the EIA guidelines.

4. Undertake special studies of specific environmental issues identified.

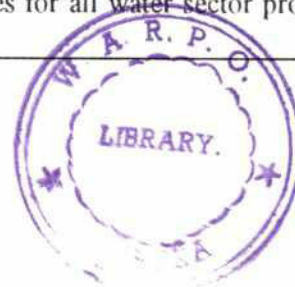
5. Assess needs for training BDG personnel in EIA methods for FCD/I projects and implement training in EIA.

6. Organize workshops to discuss the environmental implications of FCD/I projects and develop an EIA training program to include the applications of new EIA tools such as a Geographic Information System (GIS).

7. Prepare a position paper on institutional development of the EIA process for FPCO and the Ministry of Irrigation, Water Development and Flood Control.

1.4 Achievements under Phases I-III

- a) Development of EIA Guidelines and the creation of an EIA Manual. The two documents address types of interventions and projects likely to be included under future FAP programs, and may be used for other relevant water management and FCD/I projects and plans. The guidelines address EIA at the prefeasibility (regional) and feasibility (project) levels but not programs or policies. They are intended to be used in conjunction with the Guidelines for Project Assessment (GPA), which provide guidance on the economic appraisal of regional and subregional projects. A two-volume EIA Manual, a companion document to the guidelines, covers the technical aspects of EIA in more detail. The EIA Guidelines were formally approved by the FAP Review Committee in October 1992, and have been adopted by the BDG as national guidelines for all water sector projects.



b) Completion of three case studies that tested the appropriateness of the EIA Guidelines applied to three FCD/I projects: Surma-Kushiyara Project, FAP 20 Compartmentalization Pilot Project (CPP) in Tangail, and the coastal EIP Bhelumia-Bheduria Project.

(c) Seven special studies were completed:

- 1) The relationship of disease vectors to flood control
- 2) A survey of the health and nutritional impacts of the Meghna-Dhonagoda project.
- 3) Nutritional consequences of fish biodiversity
- 4) The kala-azar epidemic in Bangladesh and its relationship to flood control embankments
- 5) Nutrient analysis of soil samples, surface water, and blue-green algae from the Chandpur Irrigation Project
- 6) The effects of flood protection on soil fertility
- 7) National Charland Inventory of the Brahmaputra-Jamuna, Ganges, Padma, and middle and Lower Meghna rivers.

A supplementary study of the socioeconomic patterns of charland communities, with special emphasis on the social and environmental concerns of women on chars was extended in scope to address char flood-proofing issues.

(d) EIA Training. Based on the results of needs assessment, appropriate course material and practical exercises relevant to Bangladesh were developed. A total of 32 local participants, drawn from high and mid-level government officials and consultants, participated in two workshops on methodology and applications of EIA in Bangladesh. Executive seminars on environmental management and EIA were presented to 42 high-level BDG officials.

Apart from achieving the specific objectives, the study has worked closely with all of the FAP regional studies. The study has also recommended guidelines and criteria for the planning, design, and implementation of projects under the FAP.

1.5 Phase IV Program

Phase IV was originally scheduled to run from November 1993 to April 1995. Following protracted contract finalization between ISPAN and USAID/Washington, Phase IV activities were initiated in February 1994. In Phase IV, FAP 16 will seek to build upon the previous achievements of the project by providing the advice, training, and technical support needed to help institutionalize EIA for water sector projects in Bangladesh.

The training of EIA professionals plays a critical role in the implementation of EIA. Therefore, the main objective of FAP 16 Phase IV is to upgrade EIA training for relevant government agencies, NGOs, and the private sector. Broader-based awareness of EIA issues will also be addressed by raising public understanding of the importance of EIA to sustainable development. In support of the training objectives of Phase IV, a series of rapid field surveys will generate baseline data.

This phase of the project will also address specific environmental questions of concern to the FAP, and produce, in collaboration with the River Research Institute, a special study on the effect of flood-borne sediments on soil fertility in the floodplains of Bangladesh.

The workplan for the FAP 16 activities for the period February 1994 through April 1995 is outlined, and its schedule presented, in Table 1 and Figure 1. The workplan describes the activities and tasks required to meet the TAPP objectives. The workplan is based on the assumption that the FPCO approves the proposed activities in time for preparation and implementation of the activities. This workplan is based on the following objectives:

1. Establish a basis for long-term training in EIA in Bangladesh, especially to serve the needs of the water sector.
2. Establish a sound working relationship with the Department of Environment.

3. Provide information and professional support to the FAP with regard to specific environmental issues.

4. Promote the institutionalization of EIA through development of a sound long-term system that effectively incorporates EIA into the water resource project cycle, and provide support to the ongoing development of local environmental capabilities.

The outputs of FAP 16's Phase IV activities will be:

- A final discussion paper on the institutionalization of EIA in Bangladesh.
- A paper on PER for the water resource sector.
- A paper ranking institutions capable of handling long-term EIA training.
- A paper identifying new or additional environmental training needs.
- A paper determining ways in which EIA training can be organized in the future.
- 3-5 senior government officials trained in EIA for sustainable development.
- A core group of people trained in EIA implementation (see Chapter 3).
- A cadre of people capable of training others in EIA implementation (see Chapter 3).
- A set of five workshop reports, one for the training of trainers workshop, and one each for the four skills workshops.
- A completion report for FAP 16.

Table 1 Activities under FAP 16, Phase IV

Initiative	Schedule
Training	
1. Hold Training of Trainers workshop	Starting 7 May 1994
2. Arrange for senior EIA professionals to travel abroad	Starting April 1994
3. Train EIA reviewers	Starting July 3, 1994
4. Hold seminars for media	Aug. 1994
5. Hold seminars for planning and design engineers on environmental concerns	Oct. 1994
6. Hold seminars for senior-level management based on case studies	Jan. 1995
7. Train EIA professionals in the private sector	Starting Feb. 1995
Training Support Activities	
1. Revise Master Training File to incorporate feedback from previous workshops	Starting Mar. 1994
2. Complete annotated bibliography in order that it can be used during training	Starting Mar. 1994
3. Conduct field surveys to collect baseline data	Starting Mar. 1994
EIA Process Operationalization	
1. Hold meetings with FPCO & DOE	May 1994
2. Draft parameters for PER and obtain approval for PER as a step in IEE	Starting May 1994
3. Revise discussion paper proposals on institutionalization	May-June 1994
4. Propose and/or discuss setting up of government EIA cells in BWDB, FPCO, and Planning Commission	May 1994
5. Propose training of Planning Commission and IMED officials in EIA review and monitoring	Starting Sep. 1994
6. Discuss with academic and other institutions the provision of graduate and post-graduate training in EE and EM	Starting Jan. 1995

Chapter 2

INSTITUTIONALIZATION OF THE EIA PROCESS

2.1 Background

To assist understanding of the purpose of some Phase IV activities, this chapter, based on the FAP 16 discussion paper "Institutionalizing the EIA Process for Water Sector Projects" (ISPAN, October 1993), presents some background information on institutionalization. Where appropriate, the activities that FAP 16 is undertaking to aid the process of institutionalization are described.

2.1.2 EIA for the Water Sector

The FPCO, through FAP 16, has taken the lead in developing standard systems and procedures for reflecting concerns for practical environmental management in the water sector. It has prepared EIA Guidelines and an EIA Manual and has also begun systematic training of the Bangladesh Water Development Board (BWDB) staff and other government, NGO, and private sector professionals to review IEE/EIA work. Environmental concerns now feature prominently in FAP projects, and the government and donors are committed to take them into account in future projects.

It is now generally recognized that water resource development has to be both multidisciplinary and multisectoral, which means the planning process has to give even greater importance to the assessment of project or program impact on the environment. It must be recognized that environmental planning and assessment are essential for all development proposals, and both the FPCO and the BWDB need to set up EIA cells in their organizations. All development work affects several sectors at the same time, therefore other agencies in the water sector are expected to take up the EIA

process and integrate it into their planning system as well. The main problem is not only conceptualizing and justifying projects, but ensuring that they are robust and pass all the several stages of fitness for inclusion in the national development plan as a viable project.

2.1.2 Institutionalization of EIA in the Water Sector

It is essential that the EIA process be institutionalized in the whole development planning and investment process. To that end, the development of sound and timely institutional mechanisms for environmental assessment and management in the water sector is of vital importance. Institutionalizing the EIA process in the water sector may lead to the integration of environmental concern in the entire development planning system. Any attempt to separate the EIA system from integrated planning will only result in the marginalization of environmental issues. ?

The FPCO, through the efforts of FAP 16, has endeavored to institutionalize the EIA process within FAP, but the EIA process has significance beyond FAP and indeed beyond the water sector. Institutionalization of the EIA process within the development planning process is the ultimate objective. A beginning has been made within the MIWDFC, and this is expected to widen the process further within the water sector, including DPHE, BIWTA, Ministry of Agriculture, and the Ministry of Fisheries and Livestock.

Institutionalizing EIA for government water sector projects can be seen as a part of the follow-up to the FAP studies. The FAP has provided FPCO

with the opportunity to develop its EIA Guidelines, an EIA Manual, and Guidelines for People's Participation. This has been a significant achievement, since nothing comparable has so far been done in other sectors. The FAP has also mandated that all FAP projects be environmentally sound, thus compelling project formulators to take environmental impact into account. Although only a beginning has been made, it is acknowledged that the MIWDFC has taken a lead role in following the EIA process. Without a framework for the EIA process as a component of overall national resource development, however, there cannot be meaningful EIA work. FAP, in turn, is only one component of water resources planning, development, and management in Bangladesh. The FAP cannot stand alone; it has to be seen in the context of the entire water sector, in which dry-season demand for water, and the needs of sectors other than agriculture, assume particular importance.

Over the past three years FAP to a large extent has been an exercise on its own, but now it has to be integrated into the overall development perspective plan for the country. Given the increasing importance of EIA in project work, the lead taken by the water sector to carry out environmental assessment should place it favorably when competing for scarce resources. The parameters of water sector development are defined by the National Development Plan and the objectives of the two must coincide. That will require prioritization of development options in the context of limited investment resources; water sector projects that can conclusively demonstrate environmental soundness and potential for sustainable development will clearly be well placed to compete.

2.2 Actions to be Taken in the Water Sector

2.2.1 The Formation of EIA Cells

All water sector projects are expected to be subject to environmental assessment. EIA cells are needed in all organization in the water sector project cycle so that all project proposals are examined and

monitored for their impact on the environment. These cells should consist of the following types of professionals: planning engineers, hydrologists, hydraulic design engineer/modelling experts, irrigation/drainage engineers, environmental scientists, social scientists, natural resource economists, agriculture and soil experts, terrestrial ecologists, aquatic ecologists, and limnologists.

Phase IV Activities: FAP 16 will encourage and advise FPCO, BWDB, and IMED on the setup of EIA cells in their organizations. It will provide them encouragement by developing a dialogue between the organizations. It will assist them by providing technical support, helping them to develop a computerized database, reference material, and training.

2.2.2 Preliminary Environmental Reviews

Once EIA cells are established, they will carry out Preliminary Environmental Reviews (PERs) and draft the Terms of Reference for IEEs and EIAs. They will monitor the work of consultants engaged to conduct the environmental assessment work and review their reports. In the course of their work they will have to work closely with the DOE, the Planning Commission, and IMED. These EIA cells could consult with the Local Government Engineering Department (LGED), which has an environment training program, and with various local government bodies that will be affected by the FAP or other water sector projects. This coordination will lead to synergistic improvement in environmental knowledge and impacts of differing interventions.

Phase IV Activities: FAP 16 will help FPCO and BWDB to prepare the parameters for PERs of water sector projects, and once the cells are operational, it will assist in the technical review of the PERs.



2.2.3 Training

The formation of the EIA cells is a very important step and should be consolidated by (i) a comprehensive training plan and (ii) a series of ecological baseline studies to give realistic field training for the problems likely to be encountered.

Training, as stated earlier, is important to achieving the goals of institutionalization. In order to enable the Planning Commission to conduct objective examination of environmental proposals and assessments of FPCO and BWDB it will be necessary to train the personnel of the proposed EIA cells in four divisions of the commission and at IMED. Private sector professionals also need to be trained. Various consulting firms are now turning out IEE or EIA reports, but their quality and scope fall short of the desired level. It is expected that the private sector will do the actual IEE/EIA work in the field and write reports in conformity with the TORs agreed upon with FPCO/BWDB. **That there is an unfulfilled need in this area was obvious when consulting firms and NGOs showed great interest in sending their personnel to the workshops on EIA review held by FPCO/ISPAN from July through September 1993.**

Phase IV Activity: FAP 16 will conduct a series of training workshops and seminars in its next phase. Chapter 3 details these training activities.

2.2.4 Baseline Data Collection

In addition to training, essential baseline studies are needed. Environmental management work is often incomplete because of flawed and/or poor quality and unreliable data. More studies are needed regarding linkages between engineering interventions and their impacts on ecosystems of major importance such as fisheries; or sedimentation regimes on navigation and irrigation water supplies. A number of such studies have been suggested in various FAP regional studies, special studies of FAP 16, and the Fisheries Study (FAP 17). Several studies have been carried out by FAP

16 on disease vectors, fisheries and nutrition, the impact of silt enrichment on floodplain soils, and the impact of flooding on the riverine charlands and their inhabitants.

Phase IV Activity: In connection with its training program, FAP 16 will conduct a series of rapid field surveys, which are described in Section 3.6.3. It will also conduct a study of flood-borne sediments on soil fertility, as described in Chapter 5.



Decision maker

Chapter 3 TRAINING

3.1 Training and Awareness

In the continuation of the environmental program, FAP 16 will provide training and technical support to the Ministry of Forest and Environment. It will (1) conduct EIA training for relevant government agencies, NGOs, and private sector organizations; (2) arrange for Bangladesh officials to travel to the United States for EIA training; (3) mount a series of seminars to raise public understanding of the importance of EIA for sustainable development; (4) revise the Master Training File (5) conduct a series of rapid field surveys to generate baseline data that will be used to support the training program; and (6) develop an annotated bibliography that will also be used for training. The schedule for these activities is provided in Table 2.

The training activity will consist of a Training of Trainers (TOT) workshop, and four EIA skills training workshops. The two types of training are planned to develop (1) a critical mass of EIA trainers capable of delivering EIA training to subsequent groups of EIA reviewers and (2) 60 specialists capable of reviewing EIAs for sustainable development. Without such a critical mass of specialists there is little chance that an institutional process for systematically conducting EIA training and reviewing EIAs will be permanently established.

In addition to the formal training workshops, FAP 16 will mount a series of seminars to raise awareness of environmental issues for both private and public sectors. Both training and awareness-building will be coordinated, where possible, with

institutions such as the Public Administration Training Center (PATC), the Planning and Development Academy of the Planning Commission, the Institute for Post-Graduate Studies in Agriculture (IPSA), the Bangladesh University of Engineering and Technology (BUET), and the Bangladesh Agricultural University (BAU).

FPCO will send participants to the TOT and the EIA skills workshops. These individuals are expected to assist in setting up an EIA cell in FPCO.

3.2 Training of Trainers

The TOT workshop design is a mix of theory and practice. On the one hand, it introduces the participants to adult learning based on an experiential model, including the design and management of a training program. On the other hand, it builds the participants skills in group facilitation, in presenting information, and managing small group exercises. Currently, TOT skills in EIA are lacking the country. The TOT will address this need. Participants will be drawn from FPCO, BWDB, DOE, MIWDFC, and other relevant government organizations. FAP 16 consultants will also be trained as trainers. The objective of the TOT will be to develop a core group of 12-16 competent EIA trainers with the skill, knowledge, and aptitude to facilitate and train successive groups in EIA skills and to develop trainer guidelines that can be used for future training. The TOT will be conducted over a period of four weeks. An expatriate training of trainer specialist and an EIA content specialist

govt.

this has already taken place and now is the next step encourage

What is EIA for sustainable development?

from the U.S. will be required to conduct this training. The TOT will consist of the following tasks:

I hope this is done! At least I can never consult

1. Recruit expatriate consultants (if necessary) who have the training and technical expertise for TOT.
2. Upgrade and improve the content of the training materials used in the EIA skills workshops conducted in 1993, incorporating materials based on Bangladeshi experience, and identifying Bangladeshi examples and exercises that will strengthen the materials.
3. Write trainer guidelines to accompany the course materials.
4. Consult with FPCO and DOE to identify participants for the TOT.
5. Conduct a needs assessment to identify the training needs of the participants and incorporate them into the training plan.
6. Write a brief needs assessment report.
7. Send letters inviting participants to the TOT workshop and confirm their release from their respective organizations.
8. Conduct the training.
9. Rewrite the trainer guidelines to reflect the training experiences.
10. Write a brief report on the TOT workshop.

Contradictory

Table 2 Training Sessions and Supporting Activities

Session	Dates
TRAINING	
Training of Trainers	7 May-8 June 1994
EIA Skills Training Workshop I	3-28 July 1994
EIA Skills Training Workshop II	11 Sep-6 Oct 1994
EIA Skills Training Workshop III	13 Nov-8 Dec 1994
EIA Skills Training Workshop IV	2 Jan-26 Jan 1995
EIA Seminar Series	
Seminar for Media	14 Aug 1994
Seminar for Planning and Design Engineers	21 Aug 1994
Seminar for Policy Makers	22 Jan 1995
SUPPORTING ACTIVITIES	
Revision of Master Training File	Mar - Apr 1994
Annotated Bibliography	Mar - Jul 1994
Case Studies	
Field Survey I	27 Mar - 21 Apr 1994
Field Survey II	Jun 1994
Field Survey III	Aug 1994
Field Survey IV	Oct 1994
Field Survey V	Dec 1994

Work Products:

- A group of 12-15 EIA trainers capable of conducting EIA skills workshops using the trainer guidelines.
- Trainer guidelines that accompany the course materials and can be used for future training.
- A report on the TOT workshop.

3.3 EIA Workshops

In addition to the TOT, EIA training/workshops successfully developed and implemented under Phase III will be continued during Phase IV. The four skills training workshops, however, will

target BDG officials. This is because the function of BDG officials in the water sector is to set the TORs and review the documents that have been prepared by the private sector EIA practitioners (consultants).

The workshops will be completed before March 1995. Collectively their objective is to train about 60 BDG officials so that they will be able to accommodate environmental concerns in their project designs, participate as team members of EIA study teams, and be able to review new projects according to the EIA Guidelines. Each workshop will train a maximum of 15 participants who will be drawn from FPCO, DOE, MIWDFC, PATC, IPSA, NGOs, and other organizations that work with EIA. Each workshop will be conducted over a period of four weeks. Except for the first

workshop, expatriate assistance will not be required for the skills training.

The first skills workshop has two goals: (1) to train 12-15 public and private sector EIA reviewers to review EIA reports and (2) to provide an opportunity for FAP 16 to improve their skills. The first workshop will follow three weeks after the TOT. The two specialist trainers from the U.S. who will conduct the TOT will return from the U.S. to supervise and provide feedback to the FAP 16 team, which will conduct the workshop. Subsequently, three workshops will be conducted by the FAP 16 team. The tasks for these workshops will be to:

1. Develop a training plan defining objectives, approach, program schedule, resource persons, and facilitator requirements, and identify location and equipment needs.
2. Submit training plan to FPCO and DOE for their comments and finalize the plan.
3. Consult with FPCO and DOE to identify the participants for the workshops.
4. Conduct a needs assessment to identify the needs of the participants in order to incorporate them into the training plan.
5. Write a brief needs assessment report.
6. Write letters inviting the participants to the workshops and confirm their release from their respective organizations.
7. Conduct a team planning meeting with the trainers to clarify their roles in the workshops.
8. Identify the resource persons who will be invited to give lectures during the workshop.
9. Identify the BDG and USAID officials who will be invited to the opening ceremony.
10. Conduct the EIA skills training workshop.
11. Update and upgrade the training materials and build them into a training manual that can be used for similar training in the future.
12. Prepare four brief reports, one following each training workshop. In addition, an interim report for the training program will be prepared after the first skills workshop. This report will evaluate the training program and make recommendations for future training. A final report, to be written following the final skills workshop, will summa-

rize all the training events of Phase IV and make recommendations for similar training in the future. 13. Submit the reports and manual to DOE, USAID, and FPCO.

Work Products:

- About 60 EIA professionals with EIA skills training.
- An EIA manual consisting of a bound volume of course materials that can be used to conduct EIA skills training.
- Four EIA workshop reports, one for each skills training workshop; an interim report; and a final report.

3.4 EIA Training Abroad

Under Phase IV, a minimum of three government officials will travel abroad, preferably to the United States, for EIA training. The current budget for this activity is sufficient for three persons to travel abroad. In addition, USAID will make every effort to seek other support for training for additional qualified individuals. The objective of this training will be to familiarize the participants with the EIA process and how it is used to ensure that project options under consideration are environmentally sound. The training program will be designed in collaboration with FPCO and DOE. Arrangements for the training will be finalized by August 1994. Possible venues for the training include workshops at universities or courses offered by private organizations.

Work Product:

- Government officials trained in use of EIA for sustainable development.

3.5 EIA Awareness Training

Particular emphasis will also be given to sensitizing and training policy makers and senior-level administrators. FAP 16 will provide special assistance to the Ministry of Irrigation, Water develop-



ment and Flood Control (MIWDFC) and Ministry of Environment and Forests (MOEF). As part of this process, FAP 16 will conduct a series of seminars that will focus on the role of EIA in project development. The seminars will target the media, planning and designing engineers, and senior BDG policy makers and planners. Their strategic goals will be to "encourage focussed discussions on selected topics" to deepen understanding and awareness of EIA in sustainable development.

The tasks for the seminars will consist of:

1. Consult with FPCO and DOE to confirm seminar topics.
2. Consult with FPCO and DOE to identify people in the media, planning and design engineers, and BDG policy makers who will attend the seminars.
3. Invite participants to the seminars.
4. Identify person(s) to facilitate the seminars.
5. Identify the specialists/experts who will act as resource persons during the seminars. This will be a function of the topics that will be discussed.
6. Arrange for seminar facility, equipment needs, administrative support, and logistics.
7. Conduct the seminars.
8. Write brief reports on the seminar proceedings.

Work Products:

- Dissemination of information on EIA
- Brief reports on seminar proceedings

3.6 Supporting Activities

3.6.1 Revise EIA Master Training File

The EIA training documents developed in the course of previous phases of the Environmental Study are currently in the form of a Master Training File. FAP 16 team members will revise this document in accordance with experience gathered and feedback received so far with the intention of incrementally turning it into a Training Manual. Revision of the file started in February 1994 and

will be completed in April 1994. This activity will consist of four tasks:

1. Hold team meetings and revise schedule of activities in the Master Training File by module and by session.
2. Write session objectives to each introduction and make changes where necessary.
3. Revise introduction, lecture notes, and exercises. Insert overheads/slides, prepare handouts and maps, and revise evaluations.
4. Make copies of completed file.

Work Product:

- The revised Master Training File, will be a bound volume of course materials that will be used for EIA skills training.

3.6.2 Annotated Bibliography and Reference Material

A wide range of valuable literature exists on various aspects of the environment, and additions are continually being made. Many of these address issues relevant to EIA in Bangladesh. It is therefore necessary that the FAP 16 team be up-to-date with the current literature before the training sessions are held. To that end, each of the core team members will assemble an annotated bibliography in his or her own field from libraries and personal collections of books and articles; these references will be integrated to prepare a consolidated document that can be used for quick reference. FAP 16 team started work on the bibliography in March 1994. It will be completed by July 1994.

Work Product:

- a bound annotated bibliography of environmental reference materials.

3.6.3 Case Studies

There was a consensus during the EIA training sessions conducted in the previous phase of the

Environmental Study that the trainees need to be given more extensive exposure to field-level circumstances relating to Important Environmental Components (IECs) and the whole process of EIA. Five rapid project-related surveys have been planned for Phase IV. The surveys will be conducted by three field staff who will work in the field for a duration of four weeks. FAP 16 team members will also visit each site two times during that period. The objective of the surveys is to generate baseline data that will be used to produce short reports. These will be developed into handouts that will be used during training. The participants of the skills workshops will be taken to the project sites on their field trips. During the trip they will identify IECs and other environmental issues related to their training. The participants of each workshop will be taken to three different case study locations. The schedule of field surveys is in Table 2.

The tasks of the field surveys will be to:

1. Select a geographical area that is significant for EIA within the water resource sector.
2. Select and record IECs relevant to the area.
3. Gather information on relevant environmental issues.
4. Write short reports and prepare handouts.

Work Products:

- a set of training handouts covering the findings of each field survey
- Strengthening the knowledge base of FAP 16 team
- a short report on each of the field surveys

3.7 Staffing Requirements

Completion of this project phase will require inputs from the team leader, local consultants, and expatriate consultants. A summary of personnel needs in number of days and number of person-months is shown in Table 3.

The total of 26.8 person-months have been budgeted for expatriates. As shown in the tables, the

expatriate team leader will continue in full-time status throughout the 16-month period. Other expatriate support will come from short-term consultants, who will be providing input in the areas of EIA training and the Soil Sediment Study.

Local professionals will provide 154.7 person-months of input to Phase IV. Of this amount, 38.2 person-months will be needed for overall management activities, to be provided by a team leader and two local consultants. The EIA team will contribute 49.8 person-months and consists of EIA professionals on the FAP 16 staff. The FAP 16 professionals will concentrate primarily on institutionalization efforts, training, and case studies.

Table 3 Summary Allocation of FAP 16 Project Personnel

Summary of Project Personnel	1993												1994												1995												Total Days	Total Months																																								
	N				D				J				F				M				A				M				J				J						A				M				J																															
Expatriates																																																																														
Team Leader									18.7				21.7				21.7				21.7				21.7				21.7				21.7				21.7				21.7				21.7				21.7				18.2				16.1				21.7				21.7				18.2				357	16.5				
TDY's Consultants													18				66				15				50				7																																												156	7.2				
Fiberline Expert									7								12				5				13				5																																				65	3												
Subtotal									25.7				33.7				21.7				39.7				92.7				23.8				20.7				21.7				21.7				21.7				21.7				16.1				21.7				18.2				578	26.8												
Local Consultants																																																																														
Management	21.6				21.6				31.6				58.7				64.8				64.8				56.2				56.2				56.2				56.2				56.2				56.2				56.2				56.2				56.2				53.2				20.3				20.3				24.7				825	38.2
EIA Team									21				39.6				86.4				86.4				86.4				86.4				86.4				86.4				86.4				86.4				86.4				86.4				86.4				21.6				1075.8	49.8												
Soil Study Consultants													5				41.6				51.6				81.6				41.6				41.6				41.6				41.6				41.6				41.6				41.6				41.6				41.6				41.6				629.6	29.1								
Support Staff	64.8				64.8				64.8				64.8				64.8				64.8				64.8				64.8				64.8				64.8				64.8				64.8				64.8				64.8				64.8				64.8				812	37.6												
Subtotal	86.4				86.4				117.4				168.1				257.6				278.4				299.8				216.6				216.6				216.6				216.6				216.6				216.6				216.6				216.6				41.9				41.9				46.3				3342.4	154.7				

Expatriate Consultants are 25 days/month. Others 21.6 days/month

Chapter 4

PANEL OF EXPERTS - FISHERIES ADVISOR

Fisheries plays a very important role in the economy of Bangladesh and the nutrition of its people. The initial studies under the Flood Action Plan have indicated that Flood Control, Drainage, and Irrigation (FCD/I) projects can negatively impact fish production by limiting the water surface area available for production and through blockage of fish recruitment pathways. Due to the importance of this sector and the potential negative economic impact of planning without knowledge, the Bangladesh Government has requested the continued services of the Fisheries Advisor on the Panel of Experts to the Flood Action Plan (FAP) for an additional 20 month period.

The fisheries advisor will act in an independent advisory capacity through short-term technical assistance visits and through periodic review of FAP documents. The visits will coincide with either the meetings of the POE or will be at critical stages in the planning process as requested by FPCO. He/she will provide the technical guidance required in the fisheries sector to guide planners of the FAP toward a sustainable approach to water management. It is projected that there will be 3-4 visits required during a one year period.

This advisor will review FAP reports on fisheries and other environment-related issues. Often the timing of FAP report availability, and visits of the advisor to FPCO and the POE, will not coincide. It will therefore be necessary for the fisheries advisor to occasionally complete the review of reports and send comments and suggestions to FPCO from the U.S. FAP document review will be an important and necessary task to ensure that

fisheries and the environment are taken into account in the planning process.

The Fisheries Advisor will also be able to provide ISPAN and the Mission with project-related information. During each consultancy of the in-country consultancies, this expert will prepare a briefing paper summarizing the work completed and will inform ISPAN and the Mission on outstanding FAP issues. This expert will also actively work with FPCO in setting up its new environmental cell and provide guidance to FPCO on integrating fisheries into water resource planning and economic analysis. He/she will assist FPCO as requested in the preparation of the FAP final report or synthesis document. Table 4 shows the schedule of activities for the Fisheries Advisor.



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Table 4 Activity Schedule-Fisheries Advisor

MONTH/YEAR	ACTIVITY
March-April 1994	<ul style="list-style-type: none">-Advise FPCO in the preparation of draft FAP report. (Synthesis of all FAP studies in one document)-Guide FAP 17 data analysis study report preparation for the fisheries sector.-Assist in the design and preparation of the phase II work of FAP 17.-Review and comment on FAP reports from all regions.-Assist in the environmental cell setup and operation within FPCO.-Prepare appropriate sections of FAP report.
June-July 1994	<ul style="list-style-type: none">-Review FAP 17's draft fisheries report and make suggestions for its finalization.-Participate in POE effort to produce draft FAP report.-Participate in POE meetings-Advise FAP 17 on phase II activities which includes the integration of fisheries into water planning and management.-Advise FPCO on environmental issues through environmental cell.
November 1994	<ul style="list-style-type: none">-Participate in POE meetings and FAP conference.
January 1995	<ul style="list-style-type: none">-Advise FPCO in the finalization of the FAP report particularly on fisheries.-Advise FAP 17 on phase II activities and initial report review.-Advise FPCO on environmental issues through environmental cell.

Chapter 5

FLOOD AND SEDIMENTATION STUDY

The overall objective of the sedimentation study, a combined effort between FAP 16 and FAP 19 (Geographic Information System) is to determine the contribution of flood-borne sediments on soil composition and fertility and their net effect on Bangladesh floodplain soils.

The study of the Bangladesh floodplains, floods and sediment distribution involves highly complex and dynamic natural systems. Furthermore, infrastructure such as roads and culverts affect the natural system in ways that are difficult to identify and measure. The limited available hydrologic data on the floodplains, therefore, is often suspect or erroneous. In many areas, river and floodplain erosion and deposition processes significantly alter landscapes over a period of a few years or even within a single monsoon season.

It is not possible with the time and resources available to this project to study this subject thoroughly. Therefore, the objective cannot be fully achieved; rather, a contribution to its understanding will be sought through the study of a portion of one floodplain in Bangladesh—the left bank of the Jamuna River.

For the chosen study area this project will address the issue of current floodplain sedimentation and net effects on agriculture. It is anticipated that the following can be achieved for the study floodplain:

- determine physical characteristics of sediments and their spatial variability;
- determine chemical characteristics of the deposited sediments and estimate the associated nutritive values for agriculture;

- estimate overall sediment budget of Bangladesh from review of existing data supplemented by results of this study;
- describe sedimentation processes - sediment flux and distribution - and estimate the quantities deposited;
- develop a model for quantifying sedimentation rates and mapping spatial variability for other Bangladesh locations and conditions; and
- test methodologies for conducting studies of this nature with recommendations for the benefit of future studies.

The detailed workplan for this study is covered in a separate document, called Sedimentation Study Workplan.

