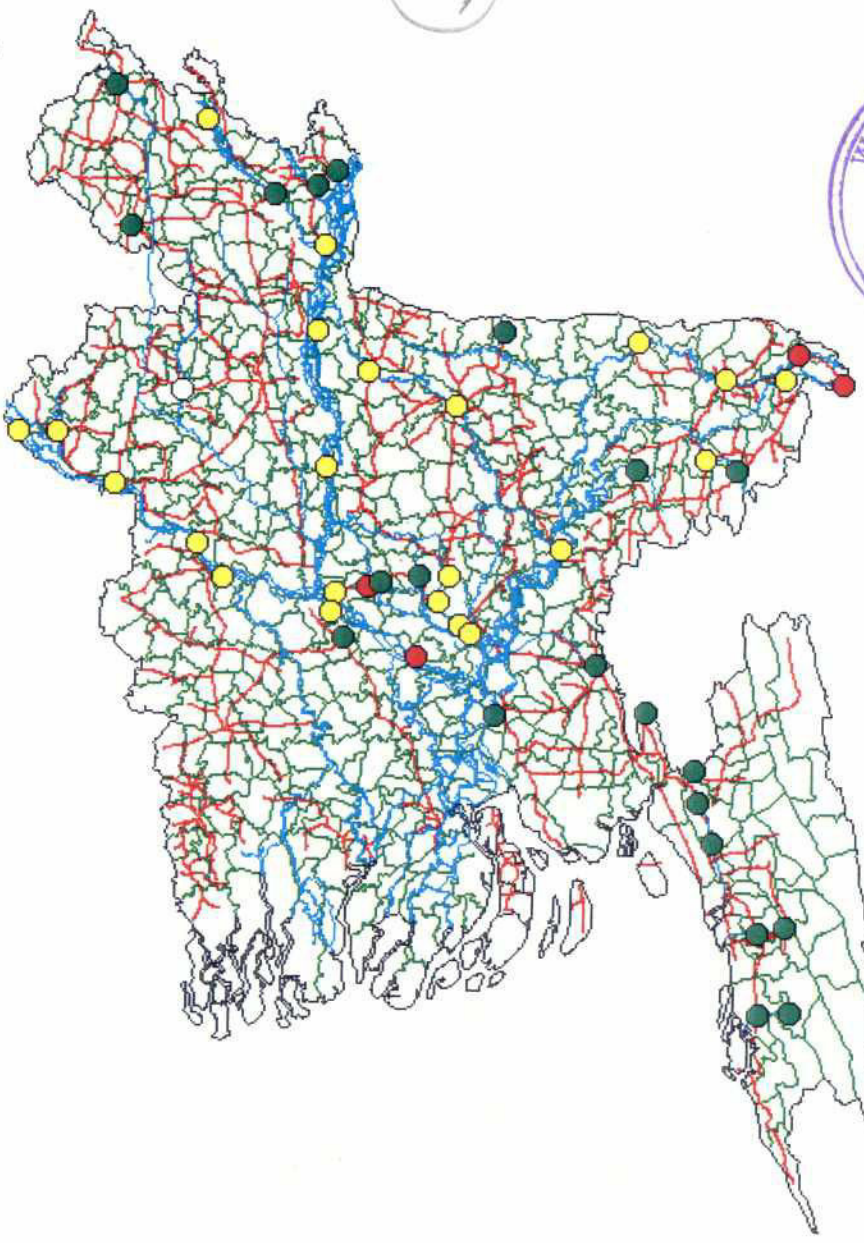
Bangladesh Water Development Board
Ministry of Water Resources

Danida
Ministry of Foreign Affairs

EXPANSION OF FLOOD FORECASTING AND WARNING SERVICES (FAP 10)

QUARTERLY PROGRESS REPORT NO. 1

JUNE to SEPTEMBER 1995



Danish Hydraulic Institute

October 1995

EXPANSION OF FLOOD FORECASTING AND WARNING SERVICES
(FAP 10)
QUARTERLY PROGRESS REPORT NO. 1

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II. KEY DATA SHEET

Country : Bangladesh, Sector: Water Resource

Project Title : Expansion of Flood Forecasting and Warning Services (FAP 10)

Report No. : 1. Quarterly Danida Ref.No. 104.Bangladesh.167
Period Covered : June-Sep.1995

Prepared by : Gregers Jørgensen
Date : 17 October 1995

Next report due : 1 January 1996

Danida Contribution : 17,097,740 (special discount deducted)

Government Contribution : 387 Lakh Taka

Other Contribution : None

Government Agreement signed : 26 December 1994

Project Period : 1995-1997 (36 month)

Implementing Agency : Bangladesh Water Development Board.

Financial Status :

Item	Budget	Expenditure 1/10/95
1. Cost of Expatriate	6,978,181	2,049,609
2. Cost of Local Consultant	1,360,680	339,490
3. Travel Cost. Accom.	1,664,680	465,044
4. Project Support	1,434,050	267,945
5. Equipment	2,174,420	474,358
6. Training	2,067,700	14.305

SUMMARY

Introduction

The project "Expansion of Flood Forecasting and Warnings Services" is a component of the Flood Action Plan and is known as FAP 10. The 3 years project was started in January 1995. The inception phase of the project took place from January to May 1995. The inception period is reported in the Final Inception Report (August 1995).

This first Quarterly Progress Report of FAP 10 covers the period from 1 June to 30 September 1995 (4 month). The following Progress Reports are planned to follow the calender year (The Progress Report issued after end of each quarter).

The project objectives, outputs, activities and inputs has been incorporated in a logical framework matrix, see Annex 1. It is the intention to keep this matrix updated during the project.

Project Progress

The monsoon has been relatively severe this year and major flooding took place in June and July. In addition minor floods was experienced in August with both Jamuna and Ganges rising above danger level. During this period a lot of efforts has been given to maintain the existing services from the Flood Forecasting and Warning Centre (FFWC). The offices, the computer system and the telephone/fax facilities at FFWC was improved before and during the monsoon.

Furthermore, during this period, new development and expansions has been initiated of the flood forecasting and warning services. The data collection through the wireless radios has been analysed and optimized. The database system are being further expanded and the data transfer links between important offices are being improved. Under module 2 the General Model is expanded to include regional secondary rivers in the setup. A comprehensive data collection has been initiated and 4 local consultants has been engaged under module 3.

Project objectives and outputs

During the 1995-monsoon there has been several requests to FFWC regarding inundation warnings on thana levels. The Government recommended to include this warnings in the project rather than detailed inundation mapping in few selected areas. It has also been recommended to use the proposed Radar in the North West Region.

To accommodate this the project output described in Annex A, has been slightly modified compared to the Government Agreement. The changes are:

- Area inundation forecast will be made at a coarse level for the major part of northern Bangladesh (Northwest, Northeast and North Central regions). The earlier plan was to develop local area inundation forecasting at 2-3 selected pilot areas.

- One river in the north west region will be selected for flash flood forecasting at a pilot level. The other river will be in the north east region. The earlier plan was to select both the rivers in the north east.

These changes follow a decision of the meeting held at Flood Plan Coordination Organisation (FPCO) on 16 August 1995. In the meeting it was also decided to improve the transfer of flood information between important offices in Dhaka. This includes support to setup linkage to a new computer in Prime Ministers Office.

The changes in the project output will not affect the achievement of the project objectives as agreed between Government of Bangladesh and Denmark in December 1994. See also the logical framework matrix Annex A.

The changes will be carried out within the project budget. The Financial Situation is unchanged.

1. Introduction

The project "Expansion of Flood Forecasting and Warnings Services" is a component of the Flood Action Plan and is known as FAP 10. The 3 years project was started in January 1995. The inception phase of the project took place from January to May 1995. The inception period is reported in the Final Inception Report (August 1995).

This first Quarterly Progress Report of FAP 10 covers the period from 1 June to 30 September 1995 (4 month). The following Progress Reports are planned to follow the calender year (The Progress Report issued after end of each quarter).

The project objectives, outputs, activities and inputs has been incorporated in a logical framework matrix, see Annex 1. It is the intention to keep this matrix updated during the project.

2. Project Objectives

The *development objective* is a contribution towards improved information to aid national preparedness for floods and to mitigate flood impacts.

The *immediate objectives* of the project is to support the Flood Forecasting and Warning Centre in order to improve performance with regard to increased mobilization of local resources and efficient utilisation of resources available.

It is likely that the immediate objective will contribute as envisaged towards the attainment of its development objectives. It is of some concern, however, that the FAP 11 project (a program for disaster preparedness), has not been initiated, which is a major prerequisite for allowing the full benefits of the present project to be realized. Although it may be too early at the present time to assess whether the immediate objective will be achieved, there is presently no definite indication that this will not be the case at the end of the project period. Through the project output (slightly revised, see outputs) it is therefore likely that the project will achieve its immediate objectives.

To achieve sustainability it is important that the Flood Forecasting and Warning Centre has a good management and staff, good office facilities and has a sufficient budget. At present the FFWC are running undermanned on ad hoc basic without any regular budget. In order to generate an income for the operation of the Centre, it is the intention of the project to introduce sale of flood information from the FFWC.

It is too early to judge the likelihood of sustainability of the project. It depends of the ability of the Government to :

- engage qualified staff in vacant positions
- setup a comprehensive FFWC in a new office
- allocate a regular budget to maintain activities

3. Outputs

Real Time forecast at regional level and provision of coarse area inundation forecast for major parts of the northern Bangladesh:

Area inundation forecast will be made at a coarse level for the major part of northern Bangladesh (Northwest, Northeast and North Central Region). The earlier plan was to develop local area inundation forecasting at 2-3 selected pilot areas. This adjustment was decided in a meeting held at FPCO 16 August 1995.

Development of the expanded General Model, which has been subcontracted to the Surface Water Modelling Centre, is progressing well. The model will be developed as one full modelling system capable to forecast water level and inundation on a coarse level. The expanded General Model will be ready to be used at FFWC in the 1996-monsoon.

The verifiable indicators for this output are 'Forecasting points increased from 16 to 30 including forecasts on secondary rivers and forecasts of inundation introduced on thana level'. This indicator will be applied during the 1996-monsoon.

Forecasting System for 2 flashy rivers established on pilot basis.

The forecasting system on flashy rivers will be developed on the Manu river in the North East Region and on one river in the North West Region. The output has been modified (in a meeting held at FPCO 16 August 1995) in comparison with the original planned approach having two flashy rivers in the North East Region.

The development of the forecasting system on Manu will start in beginning of 1996 after having developed the expanded general model. Development of a pilot system on a flashy river in the North West Region will be initiated after the 1996-monsoon.

The verifiable indicator are the use of forecasting system at FFWC, which will be applied after having developed the system.

Improved data exchange with countries in the Ganges-Brahmaputra-Meghna basins established.

During the 1995-monsoon various initiatives have been taken in order to improve the data transfer from India :

- a contact has been attempted to Ministry of Water Resources in New Delhi
- GOB has requested for Indian data through the SAARC organisation
- analyses of data transmission from the Indian flood forecasting centre

These initiatives have so far not resulted in improved transmission of relevant data from India. The verifiable indicator : 'Improved communication with India' will be used to monitor this output. It is the intention to follow up on the initiatives and strategy already taken to achieve this output.

A program of public awareness of the availability and understanding of flood

warning and forecast information.

The work plan for Module 3 has been slightly changed due to delayed approval of FAP 11. It has been decided also to use verifiable indicators for this output. The indicators are :

- phased level warning introduced
- forecast and Warning presented in a user friendly manner
- improved dissemination system
- public awareness developed in 3 pilot areas

It is the intention to monitor module 3 through these 4 indicators. A subcontract has been signed with 4 consultants from Dhaka university. The consultants has during the 1995-monsoon collected data from the field. It is too early to apply indicators on module 3.

Trained staff.

On the job training and local group training has taken place throughout the reporting period at the Flood Forecasting and Warning Centre and in the field. The present output applying the indicator 'planned number of staff trained' follows the work plan for this reporting period. However more staff is needed to be able to achieve the anticipated output.

Improved institutional structure within FFWC.

The working environment has been improved during the project period. However, the output can not be achieved before the FFWC has been established as a directorate (used as verifiable indicator) in Green road.

Other results achieved during the reporting period.

Modernization of the existing facilities at the flood forecasting and warning centre was completed in the reporting period and a new workshop for repair of radios has been established in Green Road.

The computer system (hardware and software) has been improved at FFWC and a direct link from a computer in Prime Ministers office to FFWC was also establish in the reporting period.

4. Activities

The Work plan appears from Annex 2. The progress in general follows the current Work plan and the total project achievement measured on each activity are also progressing satisfactory. However minor changes and rescheduling of the Work plan has been necessary during the reporting period. The affected activities are :

Improve Communication System, Module 1.

The project has issued recommendation to purchase new radios after having analysed the need for an improved communication equipment. Unfortunately the decision-making process has been delayed. It is planned to place the order for procurement of new radios in October 1995 and start the upgrading of the Wireless Radio System in February 1996 instead of October/November 1995. It is planned to install new radios in the field during two phases : The first phase from February 1996 to April 1996 and the second phase from November 1996 to February 1997. New radios installed during first phase shall be ready for use during the 1996 monsoon and will not delay other activities.

Supporting Studies, Module 1.

The Bangladesh Meteorological Department will install two new radars in Dhaka and Rangpur during the next two years and has decided not to maintain the old radar in Dhaka. This fact will effect some of the supporting studies. Training in interpretation of radar images will be carried out during the next year. It has been decided to setup a forecasting system for a flashy river in the North West Region applying the radar in Rangpur. Implementing of this system will be carried out in 1997 after installation of the radar in Rangpur. The time schedule for installation of the two new BMD-radars will be monitored closely during the next year. Necessary changes in the Work plan will be carried out if the installation is delayed.

Module 2. Model development.

The activity plan for the model development has been slightly revised due to change of the project output on a request from the Government. Area inundation forecast will now be carried out at a coarse level for the major part of northern Bangladesh. The earlier plan was to develop local area inundation forecasting at 2-3 selected pilot areas. The activity for development of a system for forecasting of area inundation has started applying the expanded system for forecasting on main and secondary rivers. The forecasting system will be ready for testing before the 1996 monsoon. After the test during the 1996-monsoon the final forecasting system will be ready by September 1996. Development of the pilot system for flashy rivers will take place during second half of 1996 and will be ready for implementation by the end of 1996.

Module 3. Forecast and Warning Dissemination and Public Awareness.

The work plan for module 3 has been slightly changed due to the delayed approval of FAP 11. Module 3 has links with the programme for disaster preparedness to be undertaken by FAP 11. During the monsoon 1995 the work on this module 3 was

kept low level. However, it has been decided to start all the activities from October 1995 for module 3, as proposed in the inception report, even that the FAP 11 is not approved. Timing of the approval of FAP 11 will be monitored and the Work plan and activities for module 3 will be revised accordingly.

Effect on the achievement of the immediate objectives.

Deviation from the original Work plan in module 1 and 2 has no effect on the immediate objectives. The revised Work plan fulfils the requirements. The delay of the FAP 11 approval may influence the efficiency of the developed warning and dissemination system under module 3, especially if the approval is delayed towards the end of the FAP 10 project period.

Degree of participation by the target groups.

During the reporting period (ie. the 1995 monsoon) the officers at the flood forecasting centre and warning centre have been very busy. There has been a good cooperation between the expatriates working on the project and the Government staff. The officers has participated in the training activities as required. Unfortunately the lack of staff in the vacant positions is a course of concern. It is important that all positions are occupied.

5. Strategy

The project strategy keeping the project separated into 3 modules is still relevant for the project. Module 2 has been subcontracted to the Surface Water Modelling Centre and Local Consultants has been engaged for this module. The major part of module 3 has been subcontracted to WMO and a group of four consultants from the University has been engaged under module 3. However, the interrelation between the modules and the general supports of technical development, studies and training needs closely monitoring and coordination by the Principal Consultant in close cooperation with the National Project Director.

6. Inputs

Inputs provided by Danida has largely been provided as scheduled. It appears from the financial status that the funding provided by Danida will be used as planned. Minor re-allocation of the funds might be needed during the further project implementation.

The new office facilities in Green Road as promised by the Government before project start is now scheduled to be ready by the end of 1996. The project has supported a temporary modernization of existing facilities in WAPDA building. It is important for the project that the Centre is relocated to Green Road. The Project and Danida has requested that this take place as soon as possible.

At present 6 officers are working at the Flood Forecasting and Warning Centre. There is a provision for 12 officers working at the Flood Forecasting and Warning Centre , ie. 6 positions are vacant. The project and Danida has requested the

Government to recruit new engineers to fill the vacant positions. Without occupying the vacant position it will be very difficult to carry out all the training of the staff and ensure the sustainability of the Flood Forecasting and Warning Centre in the longer term.

7. Assumptions and Risks

The three major assumption related to the implementation of the project mentioned in the project document is still valid and has not been fulfilled. The assumptions are.

That the FFWC is relocated to the Hydrological Complex at Green Road before or at the start of the project.

The FFWC is still located in WAPDA building. A new building is under construction in Green Road. The relocation is expected to take place by the end of 1996.

That GOB, after termination of the project, is capable to continue the activities of FFWC.

6 positions are vacant at the FFWC. These positions needs to be occupied with new engineers able to work in the FFWC after termination of the project.

That the interaction between the project and other FAP's, especially FAP 11 and FAP 25 is established.

Subcontracting Module 2 to the Surface Water Modelling Centre ensures exchange of knowledge gained from the Flood Management Project (FAP 25). The FAP 11 has not started; the project is prepared to establish a good cooperation with FAP 11.

The identified risk mentioned in the Project Document :

Increased data exchange with countries in the Ganges-Brahmaputra-Meghna basins is not reached during the project period.

This risk does still exist. The project are trying all possible measures to improve the data exchange from India. See also under outputs.

It appears from the logical framework matrix that other minor assumption/risk for the project implementation should be considered. These are :

- lack of interest from the Government to establish a comprehensive FFWC
- availability of data from new stations if the Government refuse to establish them
- good trained staff are leaving the FFWC
- approval of trainees for overseas training
- approval of new equipment and technology especially for communication
- availability of data from new radar

- new procured equipment delayed in the customs

8. Major Problems

There are two major problem which are considered to be serious constrains for successful project implementation, which needs to be solved by host country authorities as soon as possible. These are :

- relocation of FFWC to Green Road
- engagement of new staff in vacant positions

9. Assessment of Overall Progress

The overall progress of the project is largely as planned. It is planned to use the logical framework matrix to measure project progress. The output indicators, see Annex A, will be used to measure the effects and impact of the project.

10. Possible Review or Evaluation

The Annual review is scheduled to January 1996.

11. Financial Status

Financial status appears from the Table below :

Item	Total budg	Expend.Q3	Acc. 1/10	% of budg	Remaining
1. Cost of Expatriate	6978181	983358	2049609	29	4928572
2. Cost of Local Cons.	1360680	139640	339490	25	1021190
3. Travel Cost, Expat.	1664680	201864	465044	28	1199636
4. Project Support	1434050	91640	267945	19	1166104
5. Equipment	2174420	109778	474358	22	1700060
6. Training	2067700	6269	14305	1	2053395
1.-6. Total	15679711	1529951	3610751	23	12068957
Contigencis	1567971	----------	----------	----------	----------
Grand total (- discount)	17097682	----------	----------	----------	----------

Column 2 shows the total budget for the project.
Column 3 shows the expenditures for 3.quarter of 1995
Column 4 shows the accumulated expenditures up to 1/10 - 1995.
Culumn 5 shows % expenditures of the total budget.
Column 6 shows the remaining budget.

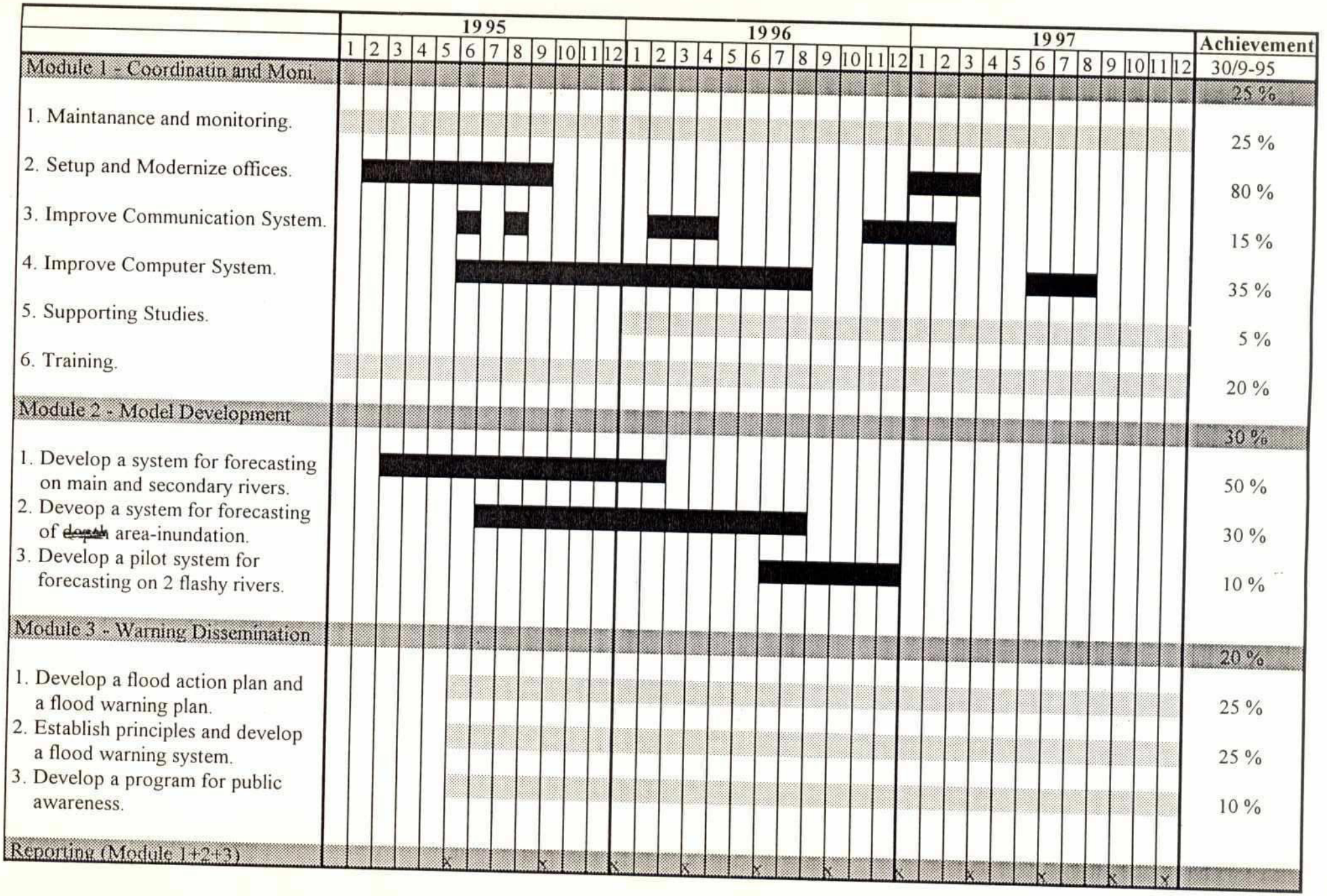
A more detailed status appears from Annex 3.

Annex I
Logical Framework Matrix

DESCRIPTION	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS AND RISKS
Development Objective : To provide improved information to aid national preparedness for floods and to mitigate flood impacts.	Reduction of number of life lost on floods and lower property losses on floods through an improved flood warning system.	A. Review of monthly and yearly flood reports. B. Interview of village people regarding disseminated flood warnings.	FAP 11 implemented and results of project sustainable
Immediate Objective : To support Flood Forecasting and Warning Centre in order to improve performance with regard to increased mobilization of local resources and efficient utilisation of resources available.	1. Training provided to professional and technical staff. 2. Expanding number of forecast points on main and secondary rivers. 3. Improvement of lead time and accuracy for real time forecasts. 4. Improvement of facilities for hydrological and meteorological monitoring including data collection. 5. A fully comprehensive flood forecasting and warning centre established within bwdb	1. Capabilities of the staff now and earlier to be compared. 2. Number of forecasting points now and earlier to be compared. 3. Sample of lead time and accuracy statistics now and earlier to be compared. 4. Review of hydrologic and meteorologic information used for flood warning preparation now and earlier. 5. Review of the established facilities at the flood forecasting and warning centre	1. Availability of staff to be trained. 2. Availability of data from improved hydrometric network. 3. Availability of sufficient and reliable data for modelling. 4. Availability of data from external sources. Radar data from BMD and data from India. 5. Interest from Government to establish a comprehensive Flood Operation Centre in a new office with a yearly budget.
Outputs : 1. Real time forecasting at regional level and provision of coarse area inundation forecast for major parts of northern Bangladesh. 2. Forecast System for 2 flashy rivers established on pilot basis. 3. Improved data exchange with countries in the Ganges-Brahmaputra-Meghna. 4. A public awareness programme of the availability and understanding of flood warning and forecast information. 5. Trained staff. 6. Improved institutional structure within FFWC.	1a. Number of forecasting points increased from 16 to 30 including forecasts on secondary rivers. 1b. Forecasting of inundation introduced on thana level. 2. Forecasting system on 2 flashy rivers has been established. 3. Improved communication with India. 4a. Phased level warnings introduced. 4b. Forecasts and Warnings presented 'userfriendly'. 4c. Improved dissemination system. 4d. Public Awareness developed in 3 pilot areas. 5a. At least 8 staff members at FFWC routine working with the expanded FFWS. 5b. Two teams of technicians capable to maintain the wireless radios. 6. FFWC established as a directorate.	1a, 1b and 2. Review of the flood forecasting bulletin and demonstration at FFWC. 3. Statistics of received data from India now and earlier. 4a. Review of the flood warning system used at FFWC. 4b. Interviews of different end users of the Forecasts and Warnings. 4c. Comparison of the dissemination system now and earlier. 4d. Interview of people in pilot areas. 5a. Simple test, through a demonstration of skills, know how and attitude. 5b. Review of the condition of the wireless radios in the field. 6. Compare the setup of the FFWC now and earlier.	1a. Availability of data from new stations. 1b. Availability of good topographic data. 2. Lack of continuos real time hydrologic data from the upstream catchments. 3. India refuse to improve the data transfer to Bangladesh. 4. Good cooperation with the Disaster Management Bureau. FAP11 project (support to DMB regarding disaster preparedness) is initiated. 5. Trained counterparts may leave the FFWC, due to transfer or better job opportunities. 6. Political support and will to expand the flood forecasting and warning services.

DESCRIPTION	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
Activities : 1.1 To maintain and monitor activities. 1.2 To Setup and modernize offices. 1.3 To improve communication system. 1.4 To improve computer and database system. 1.5 To implement supporting studies. 1.6 To train staff. 2.1 To develop a system for forecasting of water level on main and secondary rivers. 2.2 To develop a system for forecasting of area-inundation. 2.3 To develop a pilot system for forecasting of two flashy rivers. 3.1 To develop flood action and flood warning plan. 3.2 To establish principles and develop flood warning system. 3.3 To develop programmes for public awareness.	1.1 Project reports. 1.2a Existing FFWC modernized. 1.2b New workshop established. 1.2c New FFWC established in Green road 1.3a 40 new radios installed in the field. 1.3b Fast data link established between important offices. 1.4 Computer System upgraded and appropriate database developed. 1.5 Remote sensing used daily as an important tool at FFWC. 2.1 General Model for forecasting of main and secondary rivers. 2.2 GIS system for inundation mapping. 2.3 Model setup of 2 flashy river system. 3.1 Manual for flood action and flood warning. 3.2 Flood warning system incorporated at FFWC and DMB. 3.3 Education material.	1.1 Evaluation of report. 1.2a FFWC working satisfactory. 1.2b Inspection. 1.2c Inspection. 1.3a Less outfall of stations now and earlier compared. 1.3b Faster distribution of flood information now and earlier compared. 1.4 Evaluation report. 1.5 Interview of FFWC staff and reports. 2.1, 2.2, and 2.3 Demonstration of modelling system and review of reports. 3.1 Review of manual. 3.2 Evaluation of flood warning system. 3.3 Review of material and interview with end users.	1.1 Good cooperation with counterpart. 1.2 Availability of sufficient space for relocation of FFWC. 1.3 Approval of new technology for communication by Government. 1.4 Government interested to use new hardware and software developed. 1.5 Availability of data from new radar. 2. Availability of trained staff to maintain modelling system. 3. Availability of statistical data on previous floods.
Inputs: 1. Expatriate consultant services. 2. Local Consultant services. 3. Counterpart input. 4. Administrative supporting staff. 5. Computer hardware and software. 6. Office facilities. 7. Workshop facilities 8. Special data collection. 9. Data transfer links. 10. Remote Sensing. 11. Telemetric network. 12. Other project support. 13. Training program BGD and overseas	A. Approval of project. B. Progress of project.	A. Documents from Government. B. Progress Reports.	A. Availability of Government staff and funds. B. Approval of expatriate and local consultants. C. Approval of equipment procurement. D. New equipment delayed in the customs. E. Overseas training delayed due to slow approval of candidates.

Annex II
Workplan


1995
1996
1997
1 2 3 4 5 6 7 8 9 10 11 12
Achievement
Module 1 - Coordinatin and Moni.
30/9-95
25 %
1. Maintanance and monitoring.
25 %
2. Setup and Modernize offices.
80 %
3. Improve Communication System.
15 %
4. Improve Computer System.
35 %
5. Supporting Studies.
5 %
6. Training.
20 %
Module 2 - Model Development
30 %
1. Develop a system for forecasting on main and secondary rivers.
50 %
2. Deveop a system for forecasting of ~~depth~~ area-inundation.
30 %
3. Develop a pilot system for forecasting on 2 flashy rivers.
10 %
Module 3 - Warning Dissemination
20 %
1. Develop a flood action plan and a flood warning plan.
25 %
2. Establish principles and develop a flood warning system.
25 %
3. Develop a program for public awareness.
10 %
Reporting (Module 1+2+3)

Annex III
Budget and
Financial Status
1/10-1995

ITEM	Accumulated Exp. 1/10-95	Remaining budget	Acc. exp. % of budget	Est.Expen Q4-1995	Est. Expen 1995	Est. Expen 1996	Est. Expen 1997	Total Budget DKK
1.1 Module 1 Principal consultant	7.1 manmonth	11.9 manmonth	39	0.7 manmonth	7.8 manmonth	5.1 manmonth	5.1 manmonth	18 manmonth
Computer System Expert	3.8 manmonth	5.2 manmonth	42	1.0 manmonth	4.8 manmonth	2.2 manmonth	2.0 manmonth	9 manmonth
Short Term Consultant	6.0 manmonth	10.0 manmonth	38	0.2 manmonth	6.2 manmonth	4.9 manmonth	4.9 manmonth	16 manmonth
1.2 Module 2 Expert Services	4.2 manmonth	9.8 manmonth	30	3.0 manmonth	7.2 manmonth	5.8 manmonth	1.0 manmonth	14 manmonth
1.3 Module 3 Disaster Manag. Spec.	1.1 manmonth	10.9 manmonth	9	2.0 manmonth	3.1 manmonth	4.0 manmonth	4.9 manmonth	12 manmonth
Forecast. Applic. Spec.	0.0 manmonth	4.0 manmonth	0	0.5 manmonth	0.5 manmonth	2.0 manmonth	1.5 manmonth	4 manmonth
1. Cost of Expat. Consultants	2,049,609	4,928,572	29	650,000	2,700,000	2,400,000	1,978,181	6,978,181
2.1 Module 1	17,169	302,991	5	13,000	30,000	110,000	180,160	320,160
2.2 Module 2	265,840	374,480	42	75,000	340,000	300,320	0	640,320
2.3 Module 3	56,481	343,719	14	65,000	120,000	140,000	140,200	400,200
2. Cost of Local Consultant	339,490	1,021,190	25	153,000	490,000	550,320	320,360	1,360,680
3.1 International flight tickets	106,424	369,806	22	30,000	140,000	150,000	186,230	476,230
3.2 Accomendation and per Diem	358,620	829,830	30	100,000	460,000	400,000	328,450	1,188,450
3. Travel Cost Expat.Consult	465,044	1,199,636	28	130,000	600,000	550,000	514,680	1,664,680
4.1 Admin, support staff	77,826	322,374	19	42,000	120,000	130,000	150,200	400,200
4.2 Office travel (BGD and region)	2,983	197,116	1	7,000	10,000	100,000	90,100	200,100
4.3 Reports: Printing cost etc.	7,844	138,896	5	2,000	10,000	40,000	96,740	146,740
4.4 Communication	11,798	41,562	22	3,000	15,000	20,000	18,360	53,360
4.5 O&M of equip, instal, vehicles	36,813	196,637	16	14,000	50,000	80,000	103,450	233,450
4.6 Office setup	119,020	147,780	45	1,000	120,000	10,000	136,800	266,800
4.7 Special data collection	11,661	121,739	9	8,000	20,000	60,000	53,400	133,400
4. Project Support	267,945	1,166,104	19	77,000	345,000	440,000	649,050	1,434,050
5.1 Data Transfer Link	31,259	168,841	16	10,000	40,000	60,000	100,100	200,100
5.2 Remote Sensing, Computers	5,252	328,248	2	0	5,000	60,000	268,500	333,500
5.3 Audio-visual equipment	0	126,730	0	0	0	76,730	50,000	126,730
5.4 Vehicles (2 Field and 1 Sedan)	175,305	104,834	63	0	175,306	0	104,834	280,140
5.5 Radio transceivers	46,538	753,862	6	0	50,000	700,000	50,400	800,400
5.6 Radio Spares	49,722	16,977	75	0	50,000	10,000	6,700	66,700
5.7 Office Equipment	166,281	67,169	71	0	170,000	50,000	13,450	233,450
5.8 Software Development Licenses	0	133,400	0	10,000	10,000	50,000	73,400	133,400
5. Equipment	474,358	1,700,060	22	20,000	500,306	1,006,730	667,384	2,174,420
6.1 Local in service training	14,305	152,445	9	5,000	20,000	55,000	91,750	166,750
6.2 Human Resource Development	0	200,100	0	0	0	150,000	50,100	200,100
6.3 Overseas Training	0	1,700,850	0	0	0	800,000	900,850	1,700,850
6. Training	14,305	2,053,395	1	5,000	20,000	1,005,000	1,042,700	2,067,700
Total 1.-6.	3,610,751	12,068,957	23	1,035,000	4,655,306	5,952,050	5,072,355	15,679,711
7. Contigensies (10% of total)								1,567,971
GRAND TOTAL - (discount=150.000)								17,097,682