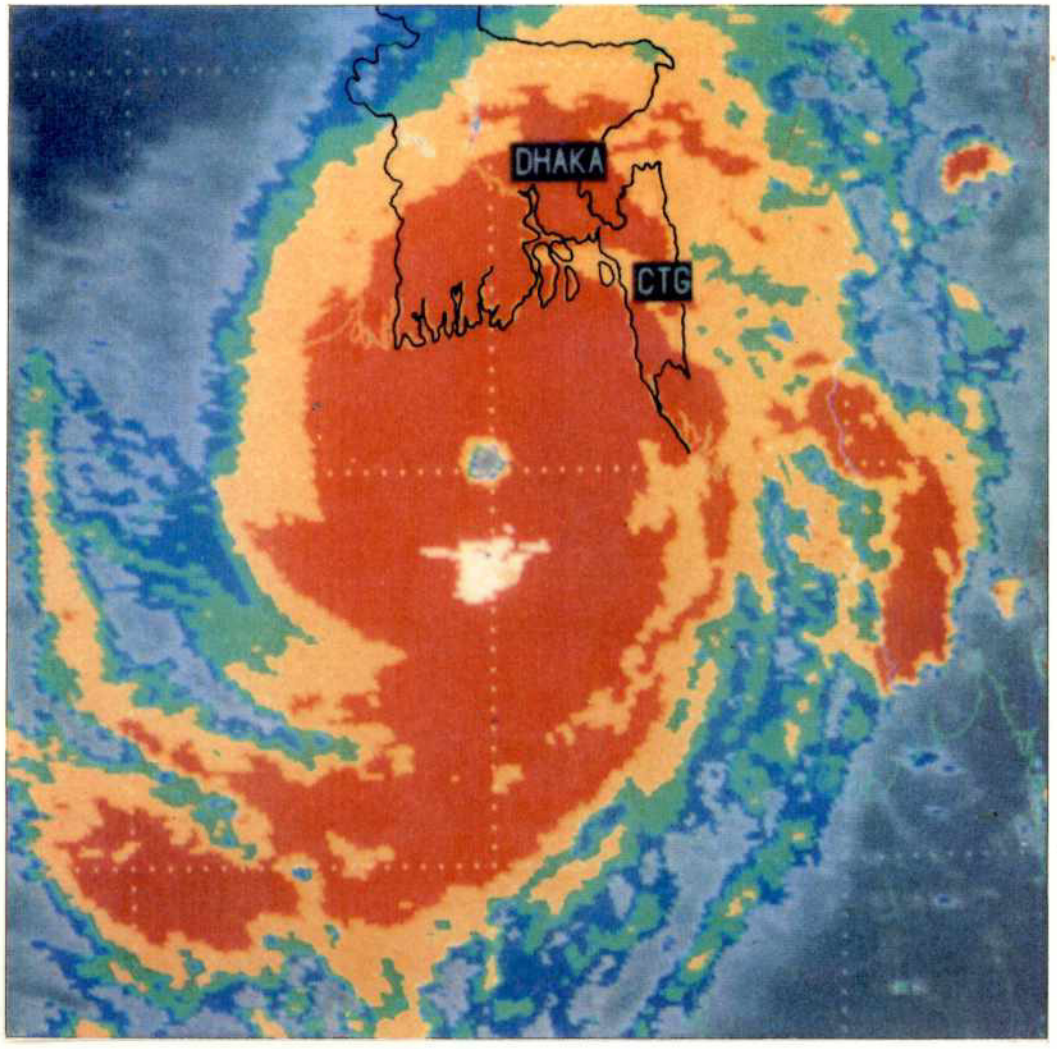
United Nations Development Programme
Government of the People's Republic of Bangladesh

Assistance to Ministry of Relief in Monitoring and Coordination of Cyclone Rehabilitation (BGD/91/021)



Inception Report
June 1992

Mott MacDonald International Ltd.
in association with
Asian Disaster Preparedness Center
assisted by
House of Consultants Ltd.

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FAP- 11

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Assistance to Ministry of Relief
in coordination of Cyclone Rehabilitation
UNDP Project No. BGD/91/021

Mott MacDonald

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(for MacDonald)

20 June 1992

UNDP/Office for Project Services
220 East 42nd Street
New York, NY, USA 10017
Attention: Mr. Daan Everts
Assistant Administrator
and Director

Dear Sir,

BGD/91/021 : INCEPTION REPORT

In accordance with Annex V of the Project Document concluded between the Government of Bangladesh and UNDP on 19 August 1991, we forward herewith the above report.

This Report also serves as the first Quarterly Report required in accordance with Clause 2.2 of the Contract concluded between UNDP : Office for Project Services and Mott MacDonald on 27 May 1992.

The Report is forwarded to you in four copies. Copies have also been sent to UNDP Field Office, Dhaka, and the Ministry of Relief.

The Report describes the work that has been undertaken since the commencement of the Project on 19 March 1992 and outlines the preliminary findings. Chapter 6 includes a revised Workplan and Staffing Schedule as requested in the Terms of Reference.

Chapter 7 highlights a number of issues that require to be clarified including detail modifications to the Terms of Reference, confirmation of the revised Workplan and various aspects of Project implementation.

We look forward to receiving your observations.

Yours faithfully,

M P Gillham
Team Leader

Encl: As stated

cc: - The Project Director, BGD/91/021
- The Resident Representative, UNDP, Dhaka
- The Director, ADPC

ASSISTANCE TO THE MINISTRY OF RELIEF IN COORDINATION OF CYCLONE REHABILITATION (BGD/91/021)

INCEPTION REPORT

LIST OF CONTENTS

LIST OF ANNEXES

LIST OF TABLES

LIST OF FIGURES

LIST OF PHOTOS

LIST OF ACRONYMS AND ABBREVIATIONS

ADAB	Association of Development Agencies in Bangladesh
ADB	Asian Development Bank
ADP	Annual Development Program
ADPC	Asian Disaster Preparedness Centre
AMD	Armed Services Division
BARC	Bangladesh Agricultural Research Council
BARI	Bangladesh Agricultural Research Institute
BBS	Bangladesh Bureau of Statistics
BDRCS	Bangladesh Red Crescent Society
BKB	Bangladesh Krishi (Agricultural) Bank
BMD	Bangladesh Meteorological Department
BPDP	Bangladesh Power Development Board
BRAC	Bangladesh Rural Advancement Committee
BRDB	Bangladesh Rural Development Board
BRRI	Bangladesh Rice Research Institute
BWDB	Bangladesh Water Development Board
CivAd	Civil Administration
CabD	Cabinet Division
CDP	Community Development Programme
CDPC	Cranfield Disaster Preparedness Centre
CE	Chief Engineer
CEP	Coastal Embankment Project
CIDA	Canadian International Development Agency
CPP	Cyclone Preparedness Programme
CPPII	Cyclone Protection Project II
DAE	Department of Agricultural Extension
DANIDA	Danish International Development Agency
DC	Deputy Commissioner
DPHE	Department of Public Heallth Engineering
DPP	Disaster Preparedness Programme (of BDRCS)
DTW	Deep Tubewell
EC	European Community
ERD	Economic Relations Division
ESCAP	Economic and Social Commission for Asia and the Pacific
FAO	Food and Agriculture Organization of the United Nations
FAP	Flood Action Plan (Bangladesh)
FFW	Food-for-Work
FPCO	Flood Plan Coordination Organization
FWC	Flood Warning Centre (of BWDB)
GB	Grameen Bank
GoB	Government of Bangladesh
IBRD	International Bank of Reconstruction and Development
ICB	International Competitive Bidding
IDA	International Development Agency (World Bank)
IFRC	International Federation of Red Cross and Red Crescent Societies (formerly the League, LRCS)
INBAT	Institute for Business Adminstration, University of Dhaka
IRRI	International Rice Research Institute (Philippines)
LCB	Local Competitive Bidding

LGEB	Local Government Engineering Bureau.
LLP	Low Lift Pump
MEF	Ministry of Environment and Forests
MFL	Ministry of Fisheries and Livestock
MIWDFC	Ministry of Irrigation, Water Development and Flood Control
MOC	Ministry of Communication
MOF	Ministry of Food
MOR	Ministry of Relief
MOS	Ministry of Shipping
NGO	Non-governmental organization
NORAD	Norwegian Overseas Development Administration
ODA	Overseas Development Administration (U.K.)
ORS	Oral rehydration salts
PC	Planning Commission
PHC	Primary health care
Prodoc	Project Document
REB	Rural Electrification Board
RHD	Roads and Highways Department
SCF	Save the Children Fund
SPARRSO	Space Research & Remote Sensing Organization
STW	Shallow Tubewell
SWC	Storm Warning Centre (of BMD)
TBA	Traditional birth attendant
Tk	Taka (Bangladesh currency unit)
TOR	Terms of Reference
T&T	Telegraphs and Telephones Department
UNDP	United Nations Development Programme
UNICEF	United Nations Childrens Fund
USAID	United States Agency for International Development
VGD	Vulnerable Group Development (Programme)
WFP	World Food Programme
WHO	World Health Organization
WMO	World Meteorological Organisation
ZRC	Zonal Relief Coordinator

BASIC CONCEPTS AND DEFINITIONS

There are significant differences in the definitions and usage of terms by various organizations, institutions, and individual experts concerned with disasters. The definitions presented here represent a compromise between those proposed by UNDRO and other international authorities, and the present usage of terms in Bangladesh. They are presented in a logical, more-or-less chronological sequence, not in alphabetical order.

DISASTER/DISASTER MANAGEMENT

Disaster

An event, natural or man-made, sudden or progressive, that seriously disrupts the functioning of a society, causing human, material, or environmental losses of such severity that the affected community has to respond by taking exceptional measures. The disruption (including to essential services and means of livelihood) is on a scale that exceeds the ability of the affected society to cope using only its own resources.

Disaster Management

Disaster management includes all aspects of planning for and responding to disasters. It refers to the management of both the risks and the consequences of disasters, and includes both:

- prevention and preparedness measures taken in disaster-prone areas in anticipation of the known hazards -- often referred to as "pre-disaster" measures; and
- response to disasters when they occur, involving search and rescue, relief, short-term repairs (sometimes referred to as "rehabilitation"), and long-term rehabilitation (sometimes referred to as "reconstruction").

PRE-DISASTER (Normal times)

Pre-disaster stage

A period when there is no immediate threat but long-term actions are taken in anticipation of the impact, at some unknown time in the future, of known hazards.

Disaster Preparedness

Measures to ensure the readiness and ability of the society -- Government, communities, and individuals -- to (i) take precautionary measures in advance of an imminent threat, in cases where advance warnings are possible, and (ii) to organize timely response in the event of a disaster. Preparedness involves:

- Forecasting and warning systems for cyclones and floods; and
- Operational capability (plans, procedures, resources) to ensure timely action at all levels -- by communities, Government, NGOs and other aid organizations -- when a warning is issued and following a disaster impact.

This includes arrangements (at local level) for the evacuation of people, livestock, and movable property, from threatened localities, and the implementation of other temporary, precautionary measures to protect lives and property when a warning is issued; and arrangements at all levels to organise search and rescue, provide relief, and make emergency repairs to restore essential services, when needed. Education, training, and practice drills, are essential at all levels.

Disaster Prevention (more accurately "Preventive Measures", referred to by some authorities as "Mitigation")

Measures designed to reduce, on a permanent basis, the adverse impact of cyclones, floods, and other potentially damaging events. This can include:

- embankments, drainage channels, afforestation, and other "structural" or "physical" measures to reduce the impact of cyclones, or the likelihood and impact of floods -- sometimes referred to as "hazard reduction": adequate maintenance must be assured;
- land use planning (or "zoning") which seeks to ensure that people and economic assets are not located in hazardous areas, and that new developments do not create new risks -- sometimes referred to as "hazard avoidance": can be attempted through regulations or incentives;
- improving construction standards for new buildings and other structures, and strengthening existing ones, to better withstand high winds, floods, earthquakes or other phenomena which are likely to occur in the locality -- sometimes referred to as "hazard resistance": can be attempted through regulations, incentives, and/or training.

Vulnerability; Vulnerability analysis

Vulnerability is the extent to which a community, structure, service, economic activity, or geographic area is likely to be damaged or disrupted by the impact of a particular hazardous phenomenon.

Vulnerability analysis is the process of estimating the vulnerability to particular hazardous phenonmena of specified elements (structures, services, or whole communities) at risk. Combined with an analysis and mapping of the hazards to which an area is prone, it provides a basis for planning relevant preventive and preparedness measures.

For engineering purposes, vulnerability analysis involves the analysis of theoretical and empirical data concerning the effects of particular phenomena on particular types of structures. For more general socio-economic purposes it involves consideration of all significant elements in society, including physical, social and economic considerations (both short- and long-term), and the extent to which essential services (and local coping mechanisms) will be able to continue functioning during and immediately after a disaster.

WARNING

Warning stage

The period from the issuing of an alert or public warning of an imminent disaster threat to its actual impact, or the passage of the threat and the lifting of the warning. The period during which pre-impact precautionary, or disaster containment, measures are taken.

Warning systems

Arrangements to rapidly disseminate information concerning an imminent disaster threat to officials, institutions, and the population at large, in the areas at immediate risk.
Warnings normally concern cyclones or floods. A warning system involves links to forecasting systems, the organizational and decision-making processes to decide on the issuing of particular warnings, and the communications facilities (radio and other) to broadcast the warnings. Its effectiveness depends on the prior education and training of officials and the population concerning the meaning of the warnings and the actions to be taken.

EMERGENCY (SURVIVAL AND RELIEF) STAGE

Emergency stage

The period during and immediately following the occurrence of a disaster, when exceptional (emergency) measures have to be taken to save lives and property, and to meet the basic needs of the stricken population in respect of shelter, drinking water, food, and medical care.

Emergency Risk Reduction measures

Actions taken in response to a disaster warning to minimize or contain the eventual negative effects. This includes, as and where needed, evacuation and other precautionary measures, flood-fighting and similar measures. These precautionary (pre-impact) measures are pre-planned, and practised, as a part of preparedness, and put into effect when specified conditions arise.

Emergency Relief

Assistance provided to save and preserve lives, and meet the basic subsistence needs of disaster victims.

Relief includes material aid to enable affected families to meet their basic needs for shelter, clothing, water, and food (including the means to prepare food), and emergency medical care. Relief supplies and services are provided free of charge -- on a humanitarian basis -- in the days and weeks immediately following a sudden disaster. They may need to be provided for extended periods in the case of severe drought and population displacements (refugees or internally displaced people).

Emergency relief measures are planned and implemented on the basis of the (post-impact) assessment, but may be initiated on the basis of past experience and preparedness plans until sufficiently comprehensive assessment data become available.

Assessment (post-impact)

The process of determining the impact of a disaster on a society; the needs for immediate, emergency measures to save and sustain the lives of survivors; and the possibilities for facilitating and expediting recovery. Assessment is an interdisciplinary process, undertaken in phases, involving on-the-spot surveys and the collation, evaluation and interpretation of information from various sources concerning both direct and indirect losses, short- and long-term effects. It involves not only determining what has happened, what resources are available to the affected communities, and what assistance might be needed, but also defining objectives and how relevant assistance can actually be provided to the victims, considering both short-term needs and long-term implications.

Damage Assessment

The preparation of specific, quantified estimates of physical damage resulting from a disaster, and recommendations concerning the repair, reconstruction or replacement of structures and equipment, and the restoration of economic (including agricultural) activities.

RECOVERY

Recovery stage

The period, following the emergency phase, during which actions are taken to enable victims to resume normal lives and means of livelihood, and to restore infrastructure, services and the economy in a manner appropriate to long-term needs and defined development objectives.
Recovery encompasses both rehabilitation and reconstruction, and may include the continuation of certain relief (welfare) measures in favour of particular disadvantaged, vulnerable groups.

Short-term Rehabilitation and Repairs

Actions taken in the aftermath of a disaster to enable basic services to resume functioning, to assist victims' self-help efforts to repair dwellings and community facilities, and to revive economic activities, including agriculture.
Rehabilitation focuses on enabling the affected populations (families and local communities) to resume more-or-less normal (pre-disaster) patterns of life.

Reconstruction / Long-term Rehabilitation

The permanent reconstruction or replacement of severely damaged physical structures, the full restoration of all services and local infrastructure, and the revitalization of the economy (including agriculture).
Reconstruction must be fully integrated into ongoing long-term development plans taking account of future disaster risks and possibilities to reduce those risks by the incorporation of appropriate mitigation measures. Damaged structures and services may not necessarily be restored in their previous form or locations. It may include the replacement of any temporary arrangements established as a part of emergency response or rehabilitation.

ASSISTANCE TO MINISTRY OF RELIEF IN COORDINATION OF CYCLONE REHABILITATION (BGD/91/021)

SUMMARY OF INCEPTION REPORT (JUNE 1992)

Project Objectives

S.01 The objectives of the Project may be stated as :

i) to strengthen the Government's capability to co-ordinate and monitor disaster related activities through the Ministry of Relief;

ii) to review existing procedures and organisational structures for disaster management with a view to their integration, reinforcement or expansion, as required, and to assess training needs and initiate preliminary training activities.

iii) to prepare a project document and other related documents for a Comprehensive Disaster Preparedness/Management programme within the context of the Flood Action Plan.

iv) in conjunction with the Flood Action Plan, to prepare a Concept Plan for the integration of measures to protect coastal areas from the effects of cyclones and tidal surges.

Introduction

S.02 This Inception Report, which also serves as the First Quarterly Report, has been prepared in accordance with a Contract concluded between UNDP/OPS and Mott MacDonald (the Contractor) on 27 May 1992. The Contractor will supply personnel to assist the MOR in undertaking the various tasks specified in S.01 above.

S.03 Under separate contractual arrangements UNDP/OPS have engaged the House of Consultants Ltd to provide Bangladesh experts.

S.04 UNDP assistance is being provided in accordance with Project Document BGD/91/021, which was signed on 19 August 1991. Apart from the supply of staff, UNDP will provide : training, staff travel, office facilities and equipment.

Background

S.05 Bangladesh is one of the poorest and most disaster prone countries in the world. Over the last twenty years, there has been on average one natural disaster every year.

S.06 Although the natural resilience of the the people, born of centuries of surviving droughts, floods and cyclones, enables them to return to normal life comparatively quickly, improvement of the systems and procedures for dealing with these recurrent disasters could further reduce resulting losses and increase the speed and efficiency of response.

S.07 UNDP responded to GOB requests for assistance with its disaster management activities and supported the Flood Policy Study, which was undertaken following the floods of 1988. This study led on to the preparation of the 26-project Flood Action Plan (FAP), which included FAP:11 Comprehensive Disaster Preparedness.

S.08 The project document for FAP:11 was being discussed when Cyclone 1991 struck. GOB immediately requested assistance with a project to provide emergency support and to finalise the preparation of FAP:11 as quickly as possible.

Project Organisation

S.09 The Project organisational structure is complex and involves nine different bodies. The executing agencies are the MOR from GOB and OPS from the donor (UNDP). A GOB Project Steering Committee should oversee the work and report to the National Disaster Prevention Council.

S.10 The Flood Plan Coordination Organisation (FPCO) also has a role to ensure that Project outputs are in conformity with other FAP approaches.

S.11 The work of the international Contractor, who is associated with the Asian Disaster Preparedness Centre, and of the local experts is guided by a Professional Panel engaged directly by UNDP/OPS.

Preliminary Activities

S.12 Mobilisation commenced following the the arrival of the Contractor's Team Leader on 20 March 1992.

S.13 The TOR for the Local Experts were finalised and a call for tenders issued on 30 March. The offers were reviewed and recommendations made to OPS on 25 April. OPS awarded the contract to the recommended local firm on 24 May.

S.14 The composition of the Professional Panel was reviewed in the light of the actual assignment and changes in discipline agreed between the Project Director, Team Leader and UNDP Dhaka. A ten-person panel is being engaged, chaired by the former Cabinet Secretary, who is also the Institutions Adviser.

S.15 It was found that GOB had not provided for any counterpart staff for the Project. Following a request by UNDP part-time counterpart staff are now available, drawn from MOR and LGEB; additional staff from other agencies are awaited.

S.16 The Project office will become the MOR's Disaster Coordination and Monitoring Unit (DCMU). This office was occupied on 9 June and officially inaugurated by the Honourable State Minister for Relief on 17 June 1992, although some furniture and fittings are still awaited.

S.17 Project investigations started from mid May and since that time some 90 different organisations, GOB, NGO, donor and projects have been visited. An Informal Workshop was held on the occasion of the official opening of the office to which all concerned government bodies were invited to send a representative, preferably an officer who acted as disaster focal point during the 1991 cyclone or 1987/88 floods.

S.18 A start has been made with the creation of a library of disaster-related literature. Some 250 publications have been obtained and these are gradually being reviewed. Previous recommendations for improvements in disaster management in Bangladesh have been collated, and are presented in Annex D to this report.

Initial Findings

S.19 Largely due to the delay in project start up, from the originally proposed August 1991 to the actual March 1992, it has been found necessary to request re-examination and clarification of some details in the TOR. Proposals are offered in this report (section 5.2 and Annex B) that would appear to be an appropriate reinterpretation, or restatement, of the specific objectives, outputs and activities. The modifications relate mainly to activities that were proposed in relation to the immediate aftermath of Cyclone 1991.

S.20 An initial analysis has been made of roles of the various GOB agencies at the time of Cyclone 1991. The effectiveness effectiveness of the arrangements will be further evaluated.

S.21 The coordination and monitoring role of MOR has been reviewed. It is apparent that significant strengthening of its information handling capabilities is required as well as defining information needs at various levels. The project will initiate work on developing systems to process assessments of damage and needs; to track and consolidate contributions; and to monitor relief and rehabilitation services. Attention will be given to the quality and relevance of information used in disaster planning and management, and to the feasibility and possible uses of a geographically-based database on the disaster-prone areas.

S.22 A preliminary review of the existing Standing Orders for Floods and Cyclones has been carried out. It is clear that considerable updating is required? clarification as a result of administrative changes, more emphasis is needed on pre-disaster? activities, wider dissemination of SOs is required and the role of NGOs needs to be addressed.

S.23 The initial review of the cyclone forecasting and warning system has identified several aspects requiring detailed follow up, including clarification of windspeed criteria. It appears that warnings do not differentiate between storms with windspeeds of 120 km/hr and those with much higher speeds and the potential for causing a very much large amount of damage.

S.24 The warnings issued by the BWDB Flood Warning Centre are also considered inadequate in that farmers cannot relate the information disseminated by the mass media to likely levels of flooding in their lands. BWDB are aware of these deficiencies and plan to address them under a proposed extension to the FAP:10 project, which is also funded by UNDP.

S.25 The need for adequate training in disaster management activities as the key to effective action in the future has been stressed by many, although precisely what training is needed, by whom and who should give and pay for it is rarely defined. A number of Bangladeshis have already received training abroad, and some 'ad hoc' training courses have been organized locally. Some leading NGOs are starting to take disaster management training very seriously.

S.26 Project activities will focus on assessing training needs, finding out in more detail what is already going on; developing an overall strategy; and initiating a programme which would be followed up under FAP:11.

S.27 A preliminary review only has been carried out of the draft FAP:11 document prepared by a UNDP/UNDRO consultant in 1990.

S.28 The Coastal and Hydraulic Engineering Specialist has completed his initial input in connection with the preparation of a Concept Plan for integrated coastal protection. The elements of the Plan are already fairly clear and can be summarised as :

- sea-facing embankments combined with afforestation
- multipurpose shelters and 'killas'
- cluster villages and house strengthening, water supply and electricity
- transport systems (roads, helipads, drop zones, landing strips, waterways and landings/jetties)
- medical facilities
- warning/communications for cyclones
- landuse planning and land registration

S.29 A vital element in any disaster preparedness and response system is communications and, in preparing the Project Document, GOB/UNDP recognised that the MOR communication systems required strengthening. Studies related to telecommunication will:

- inventory the existing systems within the country;
- review their performance during recent disasters;
- make proposals for their upgrading and/or reinforcement.

Workplan and Staffing Schedule

S.30 No significant changes to the original project workplan are proposed except that the draft FAP:11 document will be submitted in month 5 rather than month 3. This document, which is, in many ways, the most important output, requires adequate time to prepare properly.

Inauguration of the DCMU by Honourable State Minister of Relief 17 June 1992

S.31 The schedule for the various reports is:

Date	Report
20 June 1992	Inception/Quarterly Report
20 August	Evaluation of Procedures
20 September	Quarterly Report
20 September	M&E Guidelines and Formats
20 October	FAP 11 : Disaster Preparedness Document
20 October	MIS User Manual
20 October	Concept Plan for Coastal Protection
20 November	Status Report
20 December	Quarterly Report
20 January 1993	Training Report
20 January	Draft Final Report
20 February	Final Report

S.32 No staff inputs in excess of those envisaged in the Contracts and 'Prodoc' appear to be required at this time. However, proposals are made for the utilisation of three of the five unspecified months of international expert time.

S.33 Twelve months of 20 months allocated for the local Visiting Consultants have been identified in the disciplines of : public sector accounting, social anthropology/sociology/local participation, agriculture and natural resources, telecommunications, GIS, training and librarianship.

Issues Arising for Clarification

S.34 The following issues require to be addressed :

- the Terms of Reference : agreement to the proposed interpretation/ restatement
- the status of the National Disaster Prevention Council
- the posting of counterpart staff
- agreement to the revised Workplan and related staffing schedule
- role of DCMU in relation to any disaster occurring during the lifetime of the project.

S.35 In connection with this last-mentioned point, it is considered that the DCMU cannot take on responsibility for coordination, or other specific functions, until it has a complement of full-time government staff who have been suitably inducted/trained. In the meantime, project staff will provide whatever support and assistance they can to the responsible authorities, especially in relation to the management of information.

CHAPTER 1

INTRODUCTION

1.1 Background

This Inception Report has been prepared in accordance with the Contract concluded on 27 May 1992 between the United Nations Development Programme (UNDP) and Mott MacDonald Limited (termed the Contractor). This report also serves as the First Quarterly Report specified in Clause 2.2 of the Contract.

The Contractor is providing staff to assist the Government of Bangladesh, and more particularly the Ministry of Relief, on a number of specific tasks, as defined in the Terms of Reference, which are reproduced in **Annex A** to this report. Under separate contractual arrangements with UNDP, Bangladesh experts are provided to support the MOR. These experts will be supervised and directed by the Contractor's personnel.

1.2 UNDP Assistance

UNDP assistance to MOR is provided in accordance with the Project Document BGD/91/021 signed on 15 August 1991 on behalf of the Government of Bangladesh (GOB) and on 19 August 1991 on behalf of UNDP.

The UNDP assistance will cover the provision of:

- technical Assistance staff both international and national
- training
- staff travel
- office accommodation, facilities and supplies
- expendable equipment including computer supplies, software, stationeries and the like
- non expendable equipment including data processing equipment, air conditioning, transport and communication equipment

The assistance will be provided over a ten month period to:

i) establish a Disaster Coordination and Monitoring Unit (DCMU) within the MOR;

ii) review disaster management procedures of Government and non-government agencies;

iii) review damage assessment methodology and short term repair and rehabilitation activities following the 1991 cyclone; immediate

iv) initiate training in disaster management/preparedness;

v) prepare documentation for the Flood Action Plan (Project) 11: Comprehensive Disaster Management/Preparedness.

vi) prepare a Concept Plan for integrated coastal protection.

1.3 Structure of the Report

This report comprises **seven Chapters** and **ten Annexes.**

Chapter 2 discusses the background to the Project drawing on the Project Document, other published information and the results of discussions held since the commencement of the work.

Chapter 3 outlines the organisational structure of the Project which involves a Steering Committee, Professional Panel, counterpart staff, and technical assistance personnel, together with inputs from the UNDP office in Dhaka and the UNDP Office for Project Services (OPS) in New York.

Chapter 4 describes the initial activities that have been carried out and highlights the few difficulties that have been encountered.

Chapter 5 summarises the initial findings of the Project team under headings related to the TOR and intended final outputs.

Chapter 6 presents the up-dated workplan and related staffing schedule which has been developed following the appointment of the local expert group.

Chapter 7 highlights the key issues that have arisen to date. Early action should be taken by the Government and/or UNDP to resolve them.

The Annexes present more background to the information given in Chapters 4,5, 6 and 7.

1.4 Acknowledgements

The Consultants would like to acknowledge the support that has been given to date by:

Mr. K. A. Hafiz, Assistant Resident Representative, UNDP, Dhaka
Mr. A. Z. M. Hossain Khan, Joint Secretary, MOR, and Project Director
Mr. Siddiquer Rahman, Chairman, Professional Panel, and former Cabinet Secretary

CHAPTER 2

BACKGROUND

2.1 Introduction

Bangladesh is one of the poorest and most densely populated countries of the world. The overall density of population is more than 700 per sq.km. In relation to cropped area, the population density is 1,200 per sq.km. This heavy pressure on the land results in the settlement of marginal lands vulnerable to the country's recurrent floods, cyclones and surges.

Bangladesh's exposure to natural disasters is highlighted on **Table 2.1.** Such frequent events have had a serious effect on the people, the economy and the environment. While the response to disasters from the people and Government, non-government and external agencies is generally rapid, disaster management requires considerable strengthening.

Economic and social conditions for most people, both urban and rural, are difficult even in normal times. When disasters strike losses of life, crops and property are enormous, and life is made even more difficult than before for the survivors, particularly for the rural poor and landless. In 1987 and in 1988 two severe floods occurred followed in April 1991 by a devastating cyclone[1/]. Casualties, human suffering, damage to crops, property and infrastructure together with disruption of the economy and damage to the environment had a serious effect on the country.

The resilience of the people, born of centuries of surviving floods and cyclones together with the assistance mobilised and delivered from national and international sources ensured that life returned to normal comparatively quickly.

The institutional arrangements and procedures for dealing with natural disasters have evolved over the years and have stood up remarkably well. However further updating and strengthening is needed to take account of institutional, infrastructural and demographic changes that have taken place in recent years. When contemplating changes the following should be borne in mind:

> *"It is advisable that the organisation and structure of disaster management and the rules and procedures governing it, are not modified or amended too frequently and in no case without convincing reason. Much of the success of a disaster management operation particularly at the preparedness, warning and alert stages, depends on the proper motivation and understanding of the system by the members of the public. The confusion resulting from frequent changes can considerably accentuate the distress rather than mitigate it. (Munir uz Zaman, 1990)."*

1/ Throughout the report, the term "cyclone" is used to refer to any cyclonic storm with windspeeds in excess of 118 km/hr. This usage is in keeping with the general, non-scientific, use of the term in Bangladesh.

TABLE 2.1

Bangladesh : Major Natural Disasters

Year	Type of Disaster	Deaths
1644–45	Floods	+
1648	Floods	+
1769–70	Drought	+
1783–84	Drought	+
1797	Cyclone	+
1822	Cyclone	40,000
1865–66	Drought in West Bengal, present Bangladesh largely escaped	135,000
1873–74	Drought	+
1876	Cyclone	100,000
1896–97	Drought	+
1897	Cyclone	+
1898	Cyclone	175,000
1906–7	Floods in East Bengal	+
1901	Cyclone	+
1909	Cyclone (2)	+
1911	Cyclone	+
1917	Cyclone	+
1919	Cyclone	+
1922	Cyclone	+
1923	Cyclone	+
1941	Cyclone	+
1942	Cyclone	+
1943–44	Drought, irregular rain, transport dislocation and War,includes West Bengal	+ 3,000,000
1955	Floods	+
1960	Cyclone (2)	11,149
1961	Cyclone	11,468
1963	Cyclone	11,520
1964	Cyclone	196
1965	Cyclone	19,270
1966	Cyclone (2)	850
1969	Cyclone	75
1969	Tornado	922
1970	Cyclone	300,000
1972	Drought	+
1973	Cyclone (2)	103
1974	Cyclone	20
1974	Floods followed by famine	30,000
1975	Cyclone	5
1975	Floods	+
1977	Cyclone	+
1978/79	Drought	+
1981	Cyclone	2
1982	Drought	+
1983	Cyclone(2)	343
1984	Floods	+
1985	Cyclone	11,069
1986	Cyclone	14
1987	Floods	1,657
1988	Floods	2,379
1988	Cyclone	5,708
1989	Drought	+
1991	Cyclone	138,868

Source : BBS, 1990; Munir–uz–Zaman, 1990; CDL, 1992a; Kafiluddin, 1991; ADB 1991a.

+ : No data found

2.2 Disaster Management Strategy

GOB has set a high priority for the development and implementation of adequate disaster management measures in the light of the recent disasters. It has also decided to reexamine the focus of relevant ongoing projects to meet appropriate disaster prevention criteria.

2.3 Present Situation

During the Flood Policy Study in 1988/89 a report on disaster management was prepared (BGD/88/60) and a special component was incorporated in the subsequent Flood Action Plan (FAP), the FAP:11 Comprehensive Disaster Preparedness Programme. This was a programme under which an Office of Disaster Preparedness was to be established within the Ministry of Relief to strengthen its monitoring, coordination and disaster management capability and to assist concerned agencies through training in the application of procedures, Codes and Standing Orders. In addition to FAP 11, many other FAP activities contain disaster management components.

FAP 11 (BGD/88/056) was in the process of being finalised when the 29/30 April 1991 cyclone struck. Government immediately requested urgent assistance, and the present short-term project (BGD/91/021) was rapidly agreed to act as a precursor to the longer term FAP:11, with the general objectives as defined in Chapter 1. However, as project start up was delayed the aspects relating to the coordination of the repair and rehabilitation in the short run of the area affected by the April 1991 cyclone have largely been overtaken by events.

The Ministry of Relief has been designated as the focal point by the Government for the coordination of all disaster related activities, particularly short term repair and rehabilitation. The MOR is therefore required to develop close links with other ministries and agencies including the FPCO.

By the end of the project, initial steps will have been taken to establish an effective coordinating and monitoring organization. These activities will be further developed under the long-term FAP 11.

2.4 Project Strategy

The project started out as an emergency project to assist the Ministry of Relief following the 1991 cyclone, but in the process it will permit the Ministry to carry out its role as the focal point of all disaster-related activities, although to do it effectively in the long run will require continued assistance under FAP 11. Assistance given by the project will help to maximize the benefits to investments in repair and rehabilitation.

The direct beneficiary of the project will be the Ministry of Relief, but the indirect beneficiaries will be all people of Bangladesh who suffer from disasters.

UNDP assistance was sought because it has been actively involved in supporting related development projects in Bangladesh. The project will be implemented by the Ministry of Relief. OPS (Office for Project Services) will be the executing agency on behalf of UNDP. OPS will be responsible for timely delivery for all the inputs until such time as the terminal report of the project is accepted.

2.5 Development Objective

The general development objective of the project is to improve the national capability in disaster preparedness, management, relief and rehabilitation, with particular emphasis on the enhancement of the Ministry of Relief's role as the focal point for the coordination and monitoring of all disaster related activities.

CHAPTER 3

PROJECT ORGANISATION

(See comments on Organ next page)

3.1 Introduction

The project organisational structure is rather complex and involves the following parties :

- (Bangladesh) National Disaster Prevention Council
- Project Steering Committee
- Flood Plan Coordination Organisation
- Ministry of Relief
- UNDP : Office of Project Services
- UNDP : Field Office, Dhaka
- Professional Panel
- International Experts
- Local Experts : Core Team, Visiting Consultants

Figure 3.1 shows diagramatically the relationship between the parties involved.

In this Chapter, the role of each party is outlined.

3.2 Project Executing Agencies

There are two executing agencies the Ministry of Relief (MOR) from the GOB side and the Office of Project Services (OPS) from the UNDP donor side.

(a) Ministry of Relief

MOR is to provide the National Project Director (Joint Secretary level), five professional staff of various levels, and five office support staff to man the Ministry's Disaster Coordination and Monitoring Unit (DCMU). The counterpart staff are to continue to work in their respective positions after the termination of the project.

(b) OPS

As detailed in the Project Document, the executing agency on behalf of UNDP is the Office of Project Services (OPS). OPS have contracted two firms of consultants to supply personnel to assist the establishment and work within DCMU. OPS are also engaging a Professional Panel of senior Bangladesh-based personnel to advise and oversee the work of the project.

The firms are: (i) Mott MacDonald (UK) in association with the Asian Disaster Preparedness Centre of the Asian Institute of Technology (Thailand), who will provide international experts; and (ii) the House of Consultants (Bangladesh) who will provide a Core Team of four local experts together with various short term visiting consultants.

OPS will also provide the following for the DCMU :

- office accommodation, furniture, equipment and consumables
- computer hard and software
- funds for training
- transport
- communication equipment

3.3 UNDP Field Office Dhaka

The UNDP Field Office Dhaka assists OPS in the performance of its duties, but only undertakes such duties as are specifically allocated to it from time to time by OPS.

3.4 Project Steering Committee

A Steering Committee should be formed to oversee implementation, coordination and supervision of the activities of the Project. The Committee should be composed of the Secretaries of Planning Commission, Ministry of Agriculture, Forests and Environment, Irrigation, Water Development and Flood Control, Health, Education, Defence, Establishment and Relief. The Ministry of Relief should act as the Secretary of the Steering Committee and the members of the Committee will receive remuneration from the Government for their involvement in the Committee. The various studies to be prepared under the project will be submitted to the Steering Committee for review.

3.5 National Disaster Prevention Council

The project reports should be submitted to the National Disaster Prevention Council for consideration within 15 days of approval by the Steering Committee.

3.6 General Coordination

The Project is basically a coordination exercise in itself, therefore linkages for disaster related activities will be established with all concerned ministries and agencies. MOR's coordination role is essentially to act as a catalyst and to assist the concerned agencies to improve their own preparedness and to ensure implementation of short term repair and rehabilitation projects in a consistent and effective manner.

Special coordination will be required with the Ministry of Relief, ERD and the Ministry of Irrigation, Water Development and Flood Control. This latter is concerned with primary protection in the water sector through BWDB, which is responsible for implementation and rehabilitation of works, and through FPCO which is responsible for medium and long term planning. FAP 11 : Disaster Preparedness Programme, to be executed by MOR, will form part of the Flood Action Plan, which is managed by FPCO and the World Bank FAP coordinator.

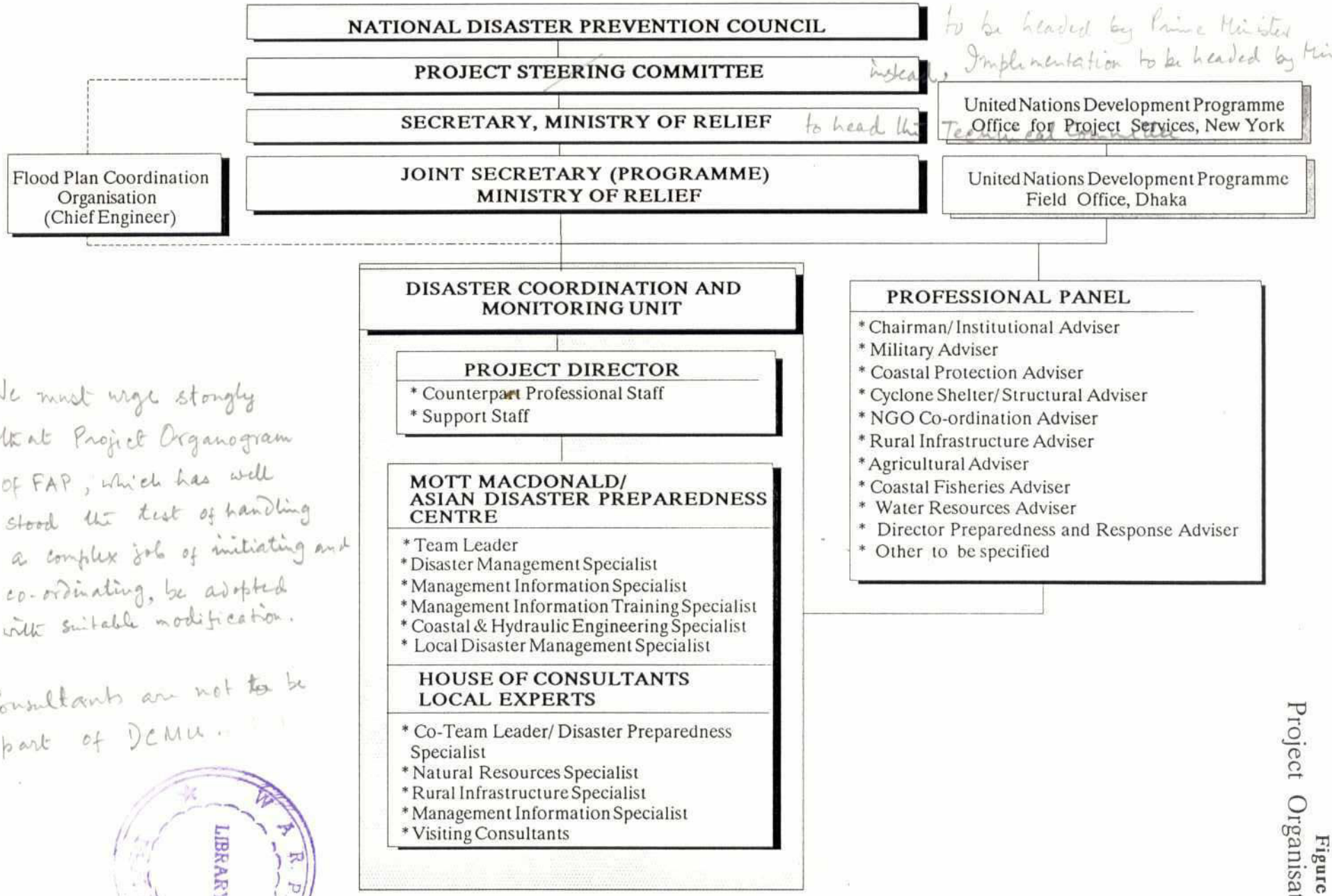


Figure 3.1
Project Organisation

- We must urge stongly that Project Organogram of FAP, which has well stood the test of handling a complex job of initiating and co-ordinating, be adopted with suitable modification.

- Consultants are not to be part of DCMU.

CHAPTER 4

PRELIMINARY ACTIVITIES

4.1 Introduction

Project activities commenced with the receipt of a fax dated 13 March 1992 from OPS to the potential international Contractor advising them that their offer had been approved by the OPS Contract Committee, subject to finalisation of local costs. The international Contractor's Team Leader (TL) was mobilised and arrived in Bangladesh on 20 March 1992.

Activities over the period 20 March to 20 June 1992 are described in this Chapter. **Figure 4.1** shows the calendar of these activities. Difficulties that have arisen in the three month period are also mentioned in the text.

4.2 Mobilisation

An initial period of one month was allowed in the overall ten month schedule for mobilisation. Within this period, it was planned to:

- finalise the international contract
- finalise Terms of Reference for and engage the local experts
- engage the Professional Panel
- mobilise the counterpart staff
- establish the office for the DCMU

(a) International Contract

The local cost element in the international contract was mutually agreed by UNDP Field Office, Dhaka and the Contractor on 30 March 1992. OPS were informed by fax on the same day.

A draft contract was faxed from OPS to the Contractor on 20 April 1992. The Contractor raised various objections as the draft Contract was not in conformity with the Contractor's revised offer dated 9 January 1992 as modified by the fax from Dhaka on 30 March. OPS reviewed the issues concerned and faxed a final Contract to the Contractor on 22 May 1992. This was accepted and signed on 27 May 1992.

The inputs to date are given in **Table 4.1.** These are generally in accordance with those given by the Contractor in the original 8 December 1991 proposal. The international staff in fact were in post before the local experts and before the counterpart staff.

TABLE 4.1
Staff Inputs to 20 June 1992 (days)

Type of Staff	Post	Name	Input				Total to date	Contract provision	Remaining
			March	April	May	June			
Mott MacDonald/Asian Disaster Preparedness Centre									
International	Team Leader	M P Gillham	19	30	31	20	100	300	200
	MIS Specialist	S L Marsden	–	–	15	–	15	15	–
	MIS Specialist	J Repp	–	–	–	–	–	60	60
	MIS Training Specialist	P Ravenscroft	–	–	–	–	–	75	75
	Disaster Management Specialist	R F Ockwell	–	–	16	20	36	90	54
	Coastal and Hydraulic Engineering Specialist	M L A Brett	–	–	12	20	32	60	28
Local	Disaster Management Specialist	M S Rahman	1	3	7	7	18	30	12
		Sub Total:	20	33	81	67	201	630	429
House of Consultants									
Local Core Team	Co-Team Leader	S. Ahmed	–	–	11	20	31	270	239
	Rural Infrastructure Specialist	M Rahman	–	–	–	–	–	270	270
	Natural Resources and Environmental Specialist	F A Khan	–	–	5	10	15	270	255
	MIS Specialist	A Razzaque	–	–	–	20	20	270	250
		Sub Total:	–	–	16	50	66	1080	1014
Visiting	Telecommunications	Nasiruddin	–	–	11	20	31	60	29
Consultants	Agriculture	M.A.Hossain	–	–	–	10	10	42	32
		Un-allocated	–	–	–	–	–	498	498
		Sub-Total	–	–	11	30	41	600	559
		TOTAL	20	33	108	147	308	2310	2002

A:\TABLE.WK1

Figure 4.1
Preliminary Activities

Description	March	April	May	June
TECHNICAL				
Ministry of Relief				
- Prepare circular letters re-emergency procedures and rehabilitation	26			
- Issue letters for informal workshop				10
- Informal Workshop/formal opening of DCMU				17
- Inception Report				20
Co-ordination				
- Visits to muiltilateral and bilateral donors			on-going	
- Visits to NGOs				
- Visits to GOB agencies				
- Visits to Projects				
ADMINISTRATION				
Foreign Sub-Contract				
- OPS advise MM offer acceptable	13			
- Team Leader arrives	20			
- Agree local costs and finalise scope of International Sub-Contract	30			
- Draft Contract received		20		
- Comments sent to OPS		23		
- Final contract received			21	
- Contract signed			27	
Local Sub-Contract				
- Finalise scope and prepare letter of Invitation	30			
- Evaluate proposals and prepare report		25		
- Prepare Draft Contract			10	
- UNDP: OPS advise HOC offer to be accepted			16	
- Contract signed			24	
Office Matters				
- Locate office and finalise lease		20		
- Sign lease			11	
- Procurement of expendable equipment				
- order for computers and software	30		28	
- furniture		20		
- air conditioners		20		
- Occupy office/DCMU				9
Transport				
- Release from warehouse		23	10	
- Lodge registration papers		24	12	
- On the road'			2 15	
Support Staff (Appointments by Contractor)				
- Typist	22			
- Office Manager/Admin.Asstt.	29			
- Senior Secretary		15		
- Typist/Word Processor				6(2)
- Drivers		23(2)	10(3)	

Source : Project records

C:\LOTUS\INCEPT\STAFF.WK1

(b) Local Experts Contract

OPS decided that the local expert services should be provided under a separate contract with the terms of the Contract requiring the local experts to work under the direction of the TL.

The Terms of Reference (TOR) for the core team of local experts given in the International Contractor's TOR were reviewed and the following changes made:

i) the post of Co-Team Leader, who was to have had a public and social institutions building background, was deleted as UNDP Field Office, Dhaka proposed to engage a former Cabinet Secretary as Institutions Advisor.

ii) the Disaster Preparedness Specialist was designated Co-Team Leader.

iii) a Management Information Specialist was added to the Core Team in recognition of the vital role that MIS will play in the development of the DCMU.

iv) the possible disciplines for the Visiting Consultants were increased by the addition of : risk analysis, macro-economics, geographic information systems, public sector accounting, social anthropology and training.

Letters of invitation were sent out to the five prequalified firms on 30 March 1992 and five offers were received on 15 April 1992. These offers were reviewed in Dhaka by the TL, UNDP Field Office, Dhaka and the GOB Project Director. The offers and review papers were faxed to OPS by 27 April.

OPS approved the award of the Contract for local expert services to the House of Consultants Ltd (HoC) at their Contract Committee meeting on 13 May 1992. Following brief negotiations, HoC agreed to commence the provision of services from 20 May 1992. The contract was issued on 24 May 1992.

Detailed TOR for the initial Visiting Consultants inputs have been prepared. These include telecommunications, social issues, agriculture, public sector accounting and geographical information systems.

(c) Professional Panel

The disciplines of the Professional Panel as proposed in the Prodoc were reviewed in the light of the Terms of Reference for the assignment and changes proposed. Three additional advisors were introduced : the Military Advisor, Structural Advisor, and NGO Coordination.

The unallocated Visiting Consultant time provided in the Prodoc for the Local Consultancy Contract was reduced from 30 to 20 months, and the Professional Panel time correspondingly increased from 24 to 34 months. This change was made to enable the project to obtain the vital services of Md. Siddiquer Rahman, the former Cabinet Secretary, who was the key GOB coordinator in the aftermath of the 1991 cyclone.

Advisory Services originally envisaged		Advisory Services now proposed	
Water Resources	(4 mm)	Water Resources	(2 mm)
Natural Resources	(4 mm)	{Agriculture	(2 mm)
		{Coastal Fisheries	(2 mm)
Social Institutions	(4 mm)	Institutions	(7.5 mm)
Communication/ Rural Infrastructure	(4 mm)	Rural Infrastructure	(2 mm)
Hydraulic Engineer	(4 mm)	Coastal Engineer	(2 mm)
Economist	(4 mm)	(Nothing proposed as yet)	
-		Military Adviser	(2 mm)
-		Structural Adviser	(2 mm)
-		NGO Coordination	(2 mm)
-		Unallocated	(10.5 mm)
	24 mm		34 mm

The 4 mm assignments envisaged in the Prodoc were reduced to initial assignments of 2 mm. This ensures that there is scope to include other disciplines or increase the time of individual advisors as the work progresses.

The qualifications for the Advisers are detailed in the TOR as: "each specialist will be a high level professional with at least 10 years broad-based experience in their respective disciplines (water resources, natural resources, social institutions, rural infrastructure, economics and hydraulic engineering) including disaster-related aspects and government and non-government institutions".

No selection procedure was detailed in the Prodoc. The possibility of advertising the Advisor posts in the press was considered but ruled out for two reasons. Firstly, the length of the project is only nine months while the minimum length of time needed to undertake a rigorous recruitment compaign would be 2/3 months. Secondly, it was considered very unlikely that the type of people required would have responded to newspaper advertisements. Hence, an accelerated procedure was adopted.

(d) Counterpart Staff

At initial meetings in March 1992, it was revealed that the counterpart support detailed in the Prodoc had been eliminated from the Project Proforma (PP) by the Planning Commission. Hence, MOR could not provide the counterpart professional and support staff required and GOB were not fulfilling one of the prerequisites for UNDP assistance. This was pointed out by UNDP in their letter to ERD dated 31 March 1992.

MOR subsequently agreed to provide part-time professional staff in the form of the National Project Director (the Joint Secretary - Programme, MOR) and two Deputy Directors from the Directorate-General of Relief and Rehabilitation. These latter were appointed on 25 May 1992; they reported for duty on 3 June 1992.

/ FPCO

As the DCMU has a coordinating function, the appointment of staff from other agencies was also considered. Hence, MOR approached BWDB, MOH, T&T and LGEB for counterpart assistance. LGEB has provided the services of an Executive Engineer full-time with effect from 16 June. PTT has agreed to supply a staff member but to date none has been nominated.

No supporting staff (peons, watchmen etc.) have been provided by MOR.

(e) Establishment of DCMU facilities

Suitable **office accommodation**, some 5000 sq.ft., was identified by the Contractor and UNDP on 15 April 1992 and UNDP concluded a 10 month lease agreement with the owner on 11 May 1992.

An initial purchase request for **computer hard and software** was made to UNDP by the Contractor on 30 March 1992 and a partial order was placed by UNDP on 4 May 1992. The supplier has provided two machines on loan from 1 June 1992 pending the delivery of the order.

UNDP had pre-ordered the DCMU **transport** (two station wagons, two microbuses and one field vehicle) and two of these were released from storage on 23 April 1992, the balance on 10 May 1992.

The initial order for **office furniture and equipment** was made by the Contractor on 21 April 1992. Locally procured desks and chairs were delivered on 15 May 1992. Offshore equipment were ordered by UNDP on 4 May 1992 and delivered at the end of May. They were installed and operational by 9 June 1992.

Accommodation and equipment within the Contractor's Regional Office in Gulshan, Dhaka were used temporarily between 20 March and 8 June 1992. The DCMU was occupied from 9 June 1992.

4.3 Contacts

Coordination is a key objective and function of the project. This has been recognised by the personnel and an intensive programme of visits has been, and continues to be, undertaken.

Regular, routine contact is maintained with MOR (contact person: A.Z.M. Hossain Khan, Joint Secretary) and the UNDP Field Office, Dhaka (contact person: K. A. Hafiz, Assistant Resident Representative).

I/F

why not with FPCO ?.

Details of the agencies contacted and persons met are given in **Annex F.** These contacts are summarised below, in all more than 170 meetings have been held to date :

Agencies Contacted	Nr.
Ministries/Departments/Divisions/Bureax	33
NGO : Agencies/Individual	13
Donors : UN family/bilateral	23
Projects : FAP and others	10
Firms undertaking relevant activities	09
	88

Notes of all discussions are prepared and kept on file. Wherever possible, relevant reports and publications have been obtained.

Project staff attend the regular monthly FAP Team Leaders meetings organised by the FPCO.

The project is also represented on the National Coordinating Committee for the Banshkhali Upazila pilot project on disaster preparedness and response being supported by Italian Cooperation in conjunction with WHO.

During the course of the project, various workshops, seminars and discussions groups will be organised. To date one Informal Workshop has been held. This followed the official opening of the DCMU by the Honourable State Minister for Relief on 17 June 1992. The summary conclusions of the Workshop and list of attendees is given in **Annex G.**

4.4 Establishment of Library and Review of Literature

Within the DCMU, it is planned to create a specialist disaster management library. Current publications from UNDRO in Geneva and reprints from the library of the Asian Disaster Preparedness Centre in Thailand have been obtained.

In order to build up as complete a collection as possible of the published material relating to disasters in Bangladesh advertisements were placed in both Bangla and English newspapers at the beginning of June. The English version is shown on **Figure 4.2**

As outlined above, project staff during the course of their visits to organisations collect copies of relevant publications and reports.

To date more than 250 documents have been collected. It is proposed to allocate one month of Visiting Consultant time for a Librarian to catalogue the material and establish an appropriate library system (See **Chapter 6**).

The collected publications are reviewed by Project staff as quickly as possible but this will take some time to complete. On the basis of the reviews to date, **Annex D** lists various recommendations regarding disaster management and notes any known follow up action.

Figure 4.2

Extract from Bangladesh Observer
June 2, 1992

DHAKA TUESDAY JUNE 2, 1992

City News

PWD employees to launch movement

Employees of the Public Works Department demonstrated in Dhaka on Sunday and threatened to launch greater movement if the authorities do not refrain from a move to cut its staff to half, reports UNB.

Announcing this at a protest meet-

MINISTRY OF RELIEF

DISASTER COORDINATION AND MONITORING UNIT

HOUSE 38, ROAD 11, DHANMONDI, DHAKA-1209

LITERATURE ON NATURAL DISASTERS IN BANGLADESH

The Ministry has recently created the above Unit. Amongst its activities will be the establishment of a library of relevant reports and other publications.

It is the intention to initiate a normal library service once the Unit is fully operational.

Any agency, group and person who has any relevant material is encouraged to call or send it to the Unit. Cover prices will be paid for commercially produced information.

The Unit is particularly interested to receive material concerning the 1970 and 1991 cyclone and the 1984, 1987 and 1988 floods.

speak on "Sweden Today" as the guest speaker.

The regular meeting of Rotary Club of Ramna will be held today (Tuesday) at 5.30 p.m. at Hotel Sonargaon.

A discussion meeting and cultural evening has been arranged jointly by Kiraranokai of Japan and Lioness Club of Dhaka, Banani at Hotel Sonargaon on June 2 at 5.30 p.m.

Special steamer services

Bangladesh Inland Water Transport Corporation, (BIWTC) has arranged special steamer services on the occasion of the holy Eid-ul-Azha to facilitate the passengers movement, a Press release of the Corporation said in Dhaka on Monday, reports BSS.

The regular steamer and ferry services will also operate as usual.

The schedule of special steamer service is : June 10 (Wednesday) Dhaka-Barisal at 1900 hrs. Kumira-Guptachara at 10.30 hrs and 15.30 hrs, Guptachara-Kumira at 07.30 hrs and 1300 hrs, on June 11 (Thursday) Barisal-Dhaka at 1900 hrs. Kumira-Guptachara at 10.30 hrs and 15.30 hrs. Guptachara-Kumira at 07.30 hrs and 1300 hrs, Chittagong-Sandwip at 10.00 hrs, Sandwip-Chittagong at 1700 hrs.

Obituary

Squadron Leader (retd) Afazur Rahman died after a prolonged illness at the Combined Military Hospital in Dhaka Monday afternoon, according to family sources. He was 79, reports BSS.

He left behind two wives, three sons and eight daughters and a host of relations and admirers to mourn his death.

The body of late Rahman will be sent to his home village at Nanupur

Now from
MOI
MOA
MOFor
MOFis
FPCO
BWDB
Only Foreign?
BMD
SPARRSO

How the visit sites were selected existing

4.5 Field Visits

The TOR indicate that the Project staff should make extensive field visits. To date two field visits have been made :

Area Visited	Date	Personnel involved
Tangail District HQ Mirzapur Upazila HQ	25 April	Co-TL, MIS Specialists (2) Disaster Management Specialist
Chittagong/Cox's Bazaar Coastal strip	30 May / 4 June	Coastal and Hydraulic Engineering Specialist with an FPCO representative

4.6 Newspaper Scanning

While reviewing the documents collected, it has been noted that victims of cyclones often give as a reason for not responding to cyclone warnings the fact that many warnings are given which are not subsequently followed by an actual cyclone. Data received from the BMD do not indicate that any such 'false' warnings are given but the view is so widespread that a detailed scanning of two newspapers (Dainik Bangla and Bangladesh Observer) from 1970 to date has been initiated to see if there is any truth in it.

4.7 Specialist Studies

Initial inputs have been made in three specialist areas envisaged in the TOR : management information systems, telecommunications and integrated coastal protection.

The findings to date are summarised in **Chapter 5** while more detailed information is given in Annexes B, E and F.

a. Endemic among the international fraternity!

Seems to describe a disastrous modern Babel with its calamitous confusion of terms! Hope due care would be exercised to prevent the confusion from creeping into the Bangladesh scene!

b. more apparent than substantive! Any substantive suggestion for improvement would be welcome.

c. But, of course! These would be pretested, it is hoped, before allowing the terms to gain currency.

4. It is interesting to note that the long-standing Flood Code and the Cyclone Code-s clearly describe the stages of disaster management: preparatory, fore-disaster and post disaster in the case of the Flood Code) and pre-disaster, alert, warning, disaster and post-disaster (in the case of the Cyclone Code). Years of field experience bear out the justification of these phases — best not tamper with it.

CHAPTER 5

INITIAL FINDINGS

5.1 Introduction

The initial findings of the project staff based upon the activities described in Chapter 4 are presented in this chapter. The first section discusses definitions and the Terms of Reference (TOR) of the project. The subsequent sections present the major findings to date in relation to the project objectives.

5.2 Definitions and Project Terms of Reference

5.2.1 Definitions

Disaster management is relatively new as a concept and discipline, and there is not yet any standard terminology that is used consistently within the disaster management fraternity at the international level. Indeed, the same terms are used to mean different things by different institutions, experts and authors. This can easily lead to confusion. Such confusion, or at least inconsistency in the use of terms, is apparent in both the project TOR and the existing (Jan. 1990) draft project document for the intended follow-on project: *Comprehensive Disaster Preparedness* (FAP.11; BGD/88/056). There also appears to be some inconsistency in the use of certain terms in the existing government Standing Orders, see Annex H.

It is important that a number of basic concepts are agreed by all concerned, and that the corresponding terms are then used consistently. Otherwise there will continue to be a lack of clarity, and potentially serious misunderstandings, concerning overall objectives and policies, and the nature and purpose of particular project activities. It will be important to develop a bilingual (English/Bangla) glossary of disaster management terms for use in Bangladesh, but this will necessarily take some time.

The definitions of some key terms which it is proposed to use in the context of this project are presented, with explanatory notes, at the front of this report. It should be noted that:

- "Disaster management" is an umbrella term encompasing all disaster-related activities. ("Emergency management" is used to refer to the management of activities during the immediate disaster, or "emergency", phase.)
- In the post-disaster period, the following (generally overlapping) phases are recognized: relief; short-term rehabilitation and repairs; long-term rehabilitation (and reconstruction).

5.2.2 Project TOR

According to the Prodoc, the project was designed to address four inter-related tasks that were on the agenda of the Bangladesh Government at that time (May 1991), as follows:

> *(a) To increase the managerial and administrative capacity of the Ministry of Relief (MOR) as the focal point in monitoring and coordinating disaster relief and rehabilitation by establishing a Disaster Coordination and Monitoring Unit (DCMU) with the capacity to collect, consolidate and analyse data on disaster-related activities;*
>
> *(b) To review the operation of existing Government and non-government emergency procedures, standing orders, forecasting and warning systems and assess improvement needs, to prepare, on this basis, proposals on a future disaster preparedness strategy for the government and other organizations involved in disaster preparedness activities;*
>
> *(c) In the light of existing requirements for professional training to design and implement in-country training programme in disaster preparedness and management;*
>
> *(d) To prepare feasibility studies on disaster-related projects with emphasis on establishing priorities for investment in repair and rehabilitation, particularly in coastal protection and infrastructure. This will result in the preparation of the Cyclone Action Plan.*

The detailed terms of reference (TOR) for the project, which were drawn up in a short space of time following the 1991 cyclone, also include:

(i) aspects relating to the planning, co-ordination and monitoring of rehabilitation activities following the 1991 cyclone;

(ii) the preparation of the Project Document for the longer-term project of Comprehensive Disaster Preparedness (FAP.11).

The full project TOR are reproduced in **Annex A.** An analysis of the specified immediate objectives, outputs and activities is presented in **Annex B.** It is found that there are ambiguities in the TOR, and that certain elements relating to rehabilitation activities resulting from the 1991 cyclone are less relevant now than they would have been if the project had started as originally envisaged in August 1991. Based on this analysis, suggestions are made for the interpretation/restatement of the TOR, particularly in relation to Immediate Objectives 1 and 2. If accepted (by Government and UNDP), the TOR would read as shown in **Table 5.1.**

TABLE 5.1

Suggested restatement of Project TOR

Objectives and Outputs	*Activities*
IMMEDIATE OBJECTIVE 1 To strengthen the Government's capability to co-ordinate and monitor disaster-related activities, through the Ministry of Relief.	
Output 1.1 An effective unit, under the MOR, with initial management information and related systems to support the promotion, co-ordination and monitoring of disaster-related activities with special reference to preparedness, relief, and short-term rehabilitation and repairs.	1.1.1 Establishing a "Disaster Co-ordination and Monitoring Unit" under the MOR, as a precursor to a more broadly-based Office/Unit to be developed under a follow-up project -- Comprehensive Disaster Preparedness/ Management (FAP.11). 1.1.2 Designing a Management Information System, and developing and installing initial applications (with appropriate hardware and software) with priority to those relevant to the consolidation, analysis and reporting of data for preparedness, relief and rehabilitation activities. 1.1.3 Developing systems for gathering, consolidating and analysing information on disasters and disaster-related activities. 1.1.4 Developing data collection formats and reporting systems. 1.1.5 Providing training to government staff of the DCMU in the use of the above systems (both computer- and paper-based).
Output 1.2 Improved arrangements for damage assessments and the preparation of repair and rehabilitation projects and programmes.	1.2.1 Identifying deficiencies in damage assessments following the 1991 cyclone, and making proposals for more effective assessments in the future. 1.2.2 Provide advice and, when necessary, propose assistance to concerned agencies in organising surveys, undertaking damage assessments, and formulating remedial works or activities.
Output 1.3 Assessment of the repair and rehabilitation efforts following the 1991 cyclone.	1.3.1 Assist MOR in the preparation of reports on the progress of repair and rehabilitation efforts following the 1991 cyclone.
IMMEDIATE OBJECTIVE 2 To review existing procedures and organisational structures for disaster management with a view to their integration, reinforcement or expansion, as required, including the need for and functions of an Office of Disaster Management; and to assess training needs and initiate preliminary training activities.	2.1.1 Review and assess the status of existing standing orders, codes, emergency procedures, forecasting and warning systems, etc., for disaster management for cyclone, floods, droughts, and earthquakes in the various concerned agencies.
Output 2.1 Evaluation of existing procedures (government and non-government) relating to disasters, and recommendations for up-dating and strengthening.	2.1.2 In the light of the above review of existing procedures, make recommendations on the modification or revisions required to up-date them.

(Table 5.1 continued)

Objectives and Outputs	*Activities*
Output 2.2 Assessment of existing and proposed organisational structures, and an outline for the duties, staffing, and rules of business of a future Office of Disaster Management, or similar body, if required.	2.2.1 Review the existing organisational structures and arrangements for disaster management, and identify deficiencies, if any. 2.2.2 In the light of the above, make proposals for the establishment and functioning of an office of disaster management or other appropriate organisational structures.
Output 2.3 An assessment of disaster management training needs and existing training resources; initiation of relevant training activities; and a disaster management training strategy for future development.	2.3.1 Assess the training needs of government officials and others, and the needs for wider public education. 2.3.2 Identify suitable institutions and training materials which may be involved in organising the required training. 2.3.3 Develop an overall, long-term training strategy, design and initiate preliminary training activities as a precursor to the main training programme to be established under the follow-up project (FAP.11).
IMMEDIATE OBJECTIVE 3 To prepare a project document and other related documents for a Comprehensive Disaster Preparedness/Management programme within the context of the Flood Action Plan.	3.1.1 In the light of the findings of 2.2 above, establish the technical assistance requirements for finalizing and implementing the proposed revisions to the existing disaster-related procedures, and for setting up an office of Disaster Management (or similar). Prepare a schedule of recruitment and placement of government and non-government staff.
Output 3.1 A project document and draft terms of reference for a follow-on project for comprehensive disaster preparedness/ management to be undertaken as FAP.11.	3.1.2 In consultation with MOR, the local UNDP office, and FPCO, prepare a project document for FAP.11: Comprehensive Disaster Preparedness/Management, a related Technical Assistance Plan, and Project Concept Paper.
IMMEDIATE OBJECTIVE 4 In conjunction with the Flood Action Plan, to prepare a concept plan for integration measures to protect coastal areas from the effects of cyclones and tidal surges into the overall disaster preparedness system and into the Flood Action Plan.	4.1.1 In consultation with the current implementation agencies, establish the concept for an integrated approach to coastal protection which would cover normal tidal as well as cyclone events.
Output 4.1 A concept plan which would outline an integrated approach to coastal protection and indicate how long-term measures can be implemented in a co-ordinated and consistent manner, taking due account of the need to emphasize priority investments.	4.1.2 Prepare a structure for the programme which would group the various elements by function, phase and sector and establish the linkages. 4.1.3 Identify priorities and suggest the multi-sectoral responsibilities for implementation. 4.1.4 Review ongoing relevant Flood Action Plan activities -- and other relevant activities -- and determine the modifications, extensions or additions that may be required.

We have already suggested that the original TOR aimed at strengthening the MOR's capability should be retained.

5.3 Strengthening the Government's capability to co-ordinate and monitor disaster-related activities through the MOR (Objective 1)

5.3.1 Introduction

The disaster-related activities of the MOR in recent times have focused on:

- disseminating the Standing Orders for Flood and Cyclone;
- supervising on behalf of the Government the joint GOB/BDRCS Cyclone Preparedness Programme;
- consolidating the damage reports submitted by the Civil Administration (DCs), using 'D' forms, following the occurrence of a flood or cyclone;
- managing (allocating and arranging the release/delivery of) food and other "relief" supplies including: Gratuitous Relief and Test Relief (grain and some cash grants from government resources); special Vulnerable Group Development (VGD) allocations; miscellaneous relief goods such as CI sheets and saris:
- administering government funds allocated for the transportation of relief materials.

This is generally in line with the "Allocation of Business" established some years ago for the then Relief and Rehabilitation Division, reproduced in **Table 5.2**, excluding the policy formulation and evaluation aspects.

The MOR has not, in recent times, exerted any effective, inter-sectoral/ inter-ministerial co-ordination function. This vital function has been variously performed, in relation to disaster response, by the President's Office/Martial Law Authorities (in 1987/8), and by the Prime Minister's Office and Cabinet Secretariat (in 1991), in conjunction with high-level inter-ministerial co-ordination committees. The tracking and co-ordination of donor contributions has been the responsibility of ERD, but actually undertaken by UNDP. There has been no systematic planning or co-ordination of disaster preparedness activities, apart from the CPP.

The results of a preliminary analysis of the functions actually performed by various government bodies following the 1991 cyclone is presented in **Table 5.3.**

There are widely differing interpretations of the terms "co-ordination", and "to co-ordinate", and this frequently gives rise to confusion or even conflict between those who seek to co-ordinate and those who are supposed to be co-ordinated. The two most common, and contrasting, interpretations can be summarized as follows:

(i) to control and direct the activities of a number of separate bodies from a higher-level (inter-sectoral) position;

(ii) to enable a number of separate bodies to work together harmoniously towards an agreed aim with each able to fulfill its particular responsibilities.

a thoroughly useless discussion - without basis in Allocation of Business.

TABLE 5.2

Relief and Rehabilitation Division
(Predecessor to Ministry of Relief) — imprecise, incorrect
Allocation of Business

1. Formulation and implementation of all policies relating to planning, coordination, monitoring and evaluation of all relief and development oriented relief programmes.

2. Formulation of policies and preparation of national disaster preparedness plan and coordination of relief measures.

3. Formulation and implementation of all projects for the purpose of settlement of distressed/displaced persons.

4. Administration of all relief work and sanction of funds for -

   a. Distribution of gratuitous relief.

   b. Distribution of house building grants and loans.

   c. Execution of test relief work.

5. Administration of aids, loans, grants and technical assistance from abroad in connection with relief and rehabilitation.

6. Operation of relief agreements with foreign countries and other similar agreements and matters connected with distribution of relief supplies coming thereunder.

Source: Annotated organogram prepared by Relief and Rehabilitation Division, Ministry of Food - copy provided by Ministry of Relief, May 1992

TABLE 5.3
GOB Agency Responsibilities in Rural Areas

Disaster Phase	Normal Times	Relief	Short Term Rehabilitation/Repair	Long Term Rehabilitation/Repair
1. Overall Coordination	CabD/PC	CabD	CabD/ERD	PC/ERD
2. Preparedness				
- Coordination?				
- Standing Orders (SO)	MOR	-	-	-
- Distribution of SO	MOR	-	-	-
- Shelters	MOE/LGEB		-	
- Shelters	BRCS/NGO			
- Raised platforms	LGEB/NGO	-	-	-
- Training	?	-	-	-
- Warnings (National/Local)				
Floods	-	BWDB/?	-	-
Cyclone	-	BMD/CPP	-	-
3. Provision of Personal Services				
- Coordination	-	CivAd	-	-
- Search and Rescue	-	Armed Services	-	-
- Emergency Medical	-	MOH/ASD	-	-
- Health	-	MOH	-	-
- Food	-	MOR/MOF	-	-
- Water	-	DPHE	DPHE	DPHE
- Emergency shelter	-	MOR/CivAd	-	-
- Burial	-	?	-	-
4. Livelihood Services				
- Coordination	CivAd	-	CivAd	-
- Agriculture	MOA	-	MOA	-
- Fisheries	MOLF	-	MFL	-
- Livestock	MOLF	-	MFL	-
- Forestry	MEF	-	MEF	-
- Credit	BKB/GB	-	BKB/GB	
5. Infrastructure				
- Coordination	PC	-	PC	PC
- Roads	RHD/LGEB	-	RHD/LGEB	RHD/LGEB
- Buildings	LGEB	-	LGEB	LGEB
- Embankments	BWDB/LGEB	-	BWDB/LGEB	BWDB/LGEB
- Channels	BWDB/LGEB	-	BWDB/LGEB	BWDB/LGEB
- Electricity	BPDB/REB	-	BPDB/REB	BPDB/REB
- Telecommunication	PTT	-	PTT	PTT
- Railways	MOC	-	MOC	MOC
- Ports and Harbours	MOS	-	MOS	MOS

Derived from Cyclone 1991 activities

Experience in many places shows that the first approach is often less effective than expected, as it receives only reluctant co-operation from those being "co-ordinated" (especially if the co-ordinator is perceived as being a peer rather than a respected higher authority) and may even inhibit the effectiveness of the operational agencies' own activities. The second ("enabling") interpretation is generally believed to produce the best results. In either case, the possession of reliable, up-to-date information, and the capacity to analyse and synthesize that information, is a pre-requisite.

The long-term arrangements for disaster management in Bangladesh are yet to be determined. The present project should make progress in this direction in connection with Objective 3 (see 5.5 below). In the mean time, the project will seek to develop relevant information systems to permit the interim DCMU to provide a useful information service and thereby "enable" more effective, co-ordinated response.

5.3.2 Development of Information Systems

The initial international MIS specialist input produced much information about existing and planned MIS systems in related projects and programmes, and resulted in an initial report on the possible uses of computer technology in support of disaster management in Bangladesh. An updated version of this report is included as Annex I.

Basic systems can be developed to assist the Ministry of Relief to process the information it receives, but attention must also be given to the quality, relevance and use of this information. The project will initiate work on the information collection and reporting processes at District and Upazila levels with a view to refining and strengthening those processes that support local decision making and to improving the relevance and accuracy of information reported to Dhaka.

Geographical Information Systems (GIS) have considerable potential as a valid long-term mechanism for assisting decision making at Upazila, District and National levels. Further detailed review will be done of capacities and existing plans for GIS development in various government agencies. The relevance of the specific ways in which this tool could be used at different levels to support disaster management will be further explored and feasible ways foward will be defined. This will include the possibility of collaboration with FAP.19 and other bodies which have similar needs, especially those with long-term capabilities.

Based on the report in Annex I, the following structures for information collection, storage and reporting will be produced:

(i) assessment and needs analysis data, based upon a much improved 'D' form;

(ii) tracking and consolidation of GOB, donor and NGO contributions;

(iii)relief and rehabilitation services (who is doing what, where?)

In addition, the project will, in collaboration with other concerned agencies, seek to develop a geographic information system (GIS) including essential related databases, on a pilot basis for one or two districts, to determine the feasibility

Cyclone Shelter/Primary School. Chakaria (Ujantia)
Additional Shelter under construction (caisson foundations)
2 June 1992

Strengthened dwarf embankments. Chakaria (Ujantia)
Shrimp producing area 2 June 1992

of using such systems as a disaster management tool in Bangladesh.

It is envisaged that all these applications would be further developed under the follow-on project (FAP.11), which would also include the development of a logistic support system and the demonstration of an electronic bulletin board.

The next international MIS specialist input will concentrate on finalizing the analysis framework for (i), (ii) and (iii), and the the analysis specifications for the pilot GIS system. Equipment requirements will also be finalized.

5.3.3 Damage Assessments and the preparation of Rehabilitation Projects

Following cyclone 1991, damage assessments were made and/or reported by:

- the civil administration
- the line agencies
- World Bank appointed consultants

The civil administration reports estimates of damage on Form 'D' (See **Figure 5.2**). These cover all sectors, but the information seems to be used only in determining relative priorities for the allocation of available relief (materials or funds) between different affected areas/administrative units.

Representatives of the line ministries/agencies submit their own sectoral assessments through their departmental channels. These data, which tend to focus more on rehabilitation/repair requirements, are compiled at various levels within each ministry/agency.

Although much information is said to be shared at upazila and district levels, it appears that there are sometimes significant differences between the information finally received, in Dhaka, through the different channels.

To date, no detailed investigations have been undertaken by Project staff to evaluate the damage assessment methodologies of the various agencies, or to compare the reports compiled by line agencies with those compiled by the civil administration and MOR. This will be undertaken in the coming months.

In the mean time, it may be noted that external consultants were engaged by bodies representing the international community to obtain objective estimates of **infrastructure damage** following the floods in 1987 and 1988, and the cyclone of 1991. Assessments by the line agencies following 1988 floods totalled US$2.3 billion. The consultants estimated damage at US$0.9 billion. There is a general tendency for line agencies to try to fund deferred maintenance under the guise of flood or cyclone damage. So long as Bangladesh relies on foreign assistance to repair and rehabilitate disaster damage, it is likely that consultants will be engaged by the donors to provide objective assessments.

!! ?

a rather snide comment. What is the premise, particularly, as the Consultant admits in the immediately preceding para that evaluation of "damage assessment methodologies" has not commenced yet.

Figure 5.3 shows the areas that were affected by Cyclone 1991, the badly affected area being subjected to winds of up to 225 km/hr (140 mph); this was 75 km either side of the 'eye'.

Figure 5.4 is interesting because it shows the actual pattern of windspeeds for a cyclone of very similar intensity which struck the US eastern seaboard in 1970.

Figure 5.5 indicates how damage to buildings increases significantly when winds above 150 km/hr are experienced.

Concerning **agricultural losses,** the agricultural Visiting Consultant has commenced work (in early June). Pending the outcome of his investigations, it is worth noting that overall national crop production did not decline significantly in the major flood years of 1987 and 1988 **(Table 5.4).** This is generally believed to be due to three main factors:

(i) increases in soil fertility and moisture content as a direct consequence of the flood;

(ii) large-scale investments in inputs (seed, irrigation, and fertilizer), by the Government and individual farmers, in an immediate rehabilitation effort;

(iii) initiative and increased efforts by the farmers.

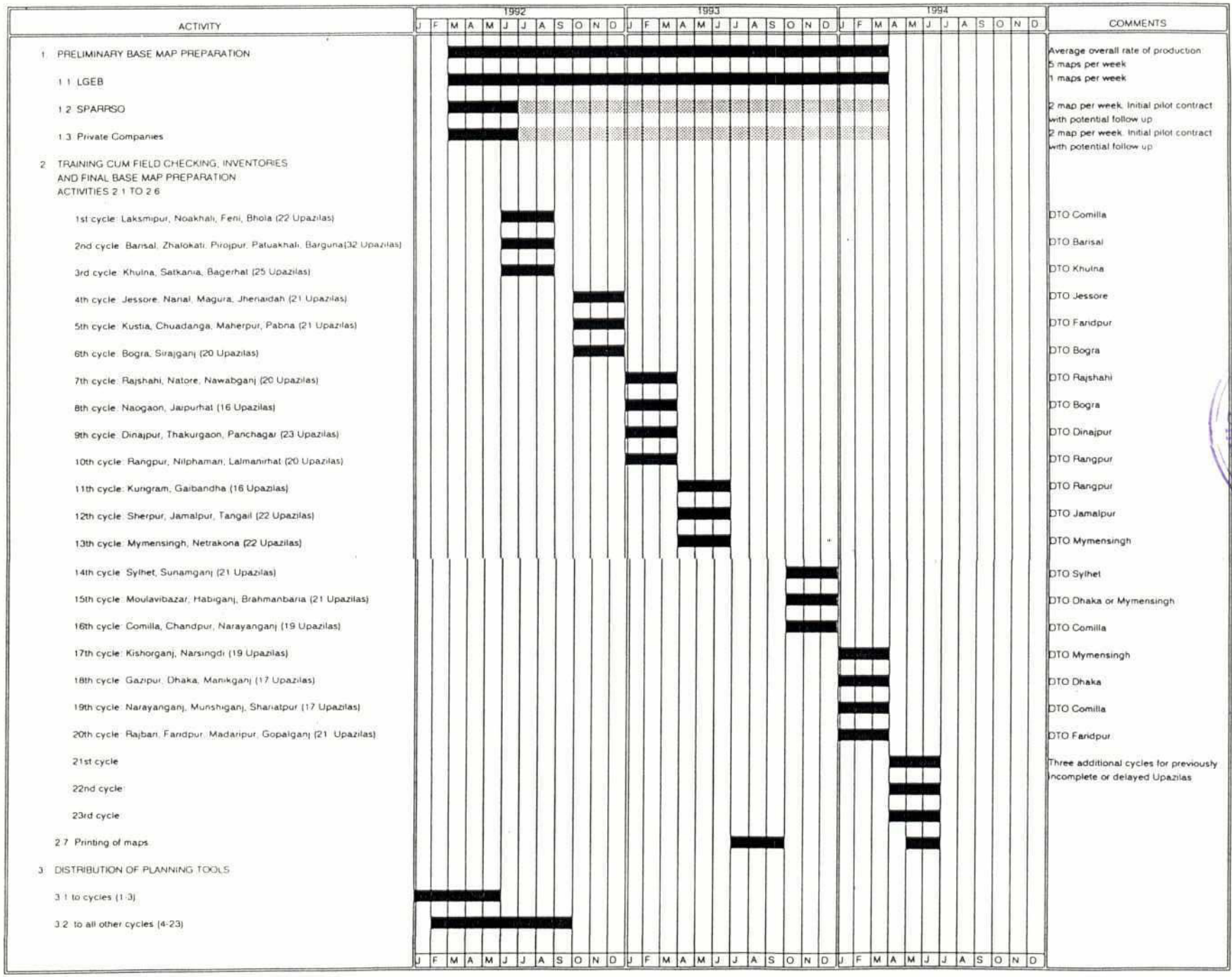
The relative importance of these different factors is not (yet) known.

As regards information in the first few days following the cyclone impact, information which is essential for the planning and organisation of initial relief efforts and the restoration of essential services, it is noted that Government officials in Dhaka report having received little information in the first three days while the BDRCS and some NGOs apparently did have information and had already formulated specific plans and appeals.

5.3.4 Repair and Rehabilitation efforts following the 1991 Cyclone

Copies have been obtained of the consultants reports referred to in 5.3.3 above, together with minutes of the meetings organised by the World Bank Resident Mission (WBRM) to coordinate rehabilitation activities (see **Table 5.5**). Assessments of the progress of the rehabilitation efforts will be undertaken, and reports be prepared, in the coming months.

Discussions with ERD indicated that the meeting on 5 September 1991 was the last rehabilitation coordination meeting held, and that subsequent coordination has been at the individual 'project' level.



Source: LGEB

Figure 5.1
Upazila Base Map Preparation Progress

'ডি' ফরম

ক্রমিক নং	ক্ষতিগ্রস্ত ব্যক্তির নাম এবং পিতা/স্বামীর নাম	এসেসমেন্ট তালিকায় ক্রমিক নং	বিধ্বস্ত গৃহের সংখ্যা		আনুমানিক মূল্য	গো-মহিষ ক্ষয়ক্ষতির পরিমান					মৃত ঘাস মোরগের সংখ্যা	আনুমানিক মূল্য	বৃক্ষাদির ক্ষয়ক্ষতির পরিমান	ফলবান বৃক্ষের ক্ষতির পরিমান	আনুমানিক মূল্য	শস্য হানির পরিমান একর হিসাবে	সাহায্যের প্রয়োজন	মন্তব্য
			আংশিক	সম্পূর্ণ		মেষ	মহিষ	গরু	ছাগল	ষাড়								
১	২	৩	৪	৫	৬	৭	৮	৯	১০	১১	১২	১৩	১৪	১৫	১৬	১৭	১৮	১৯

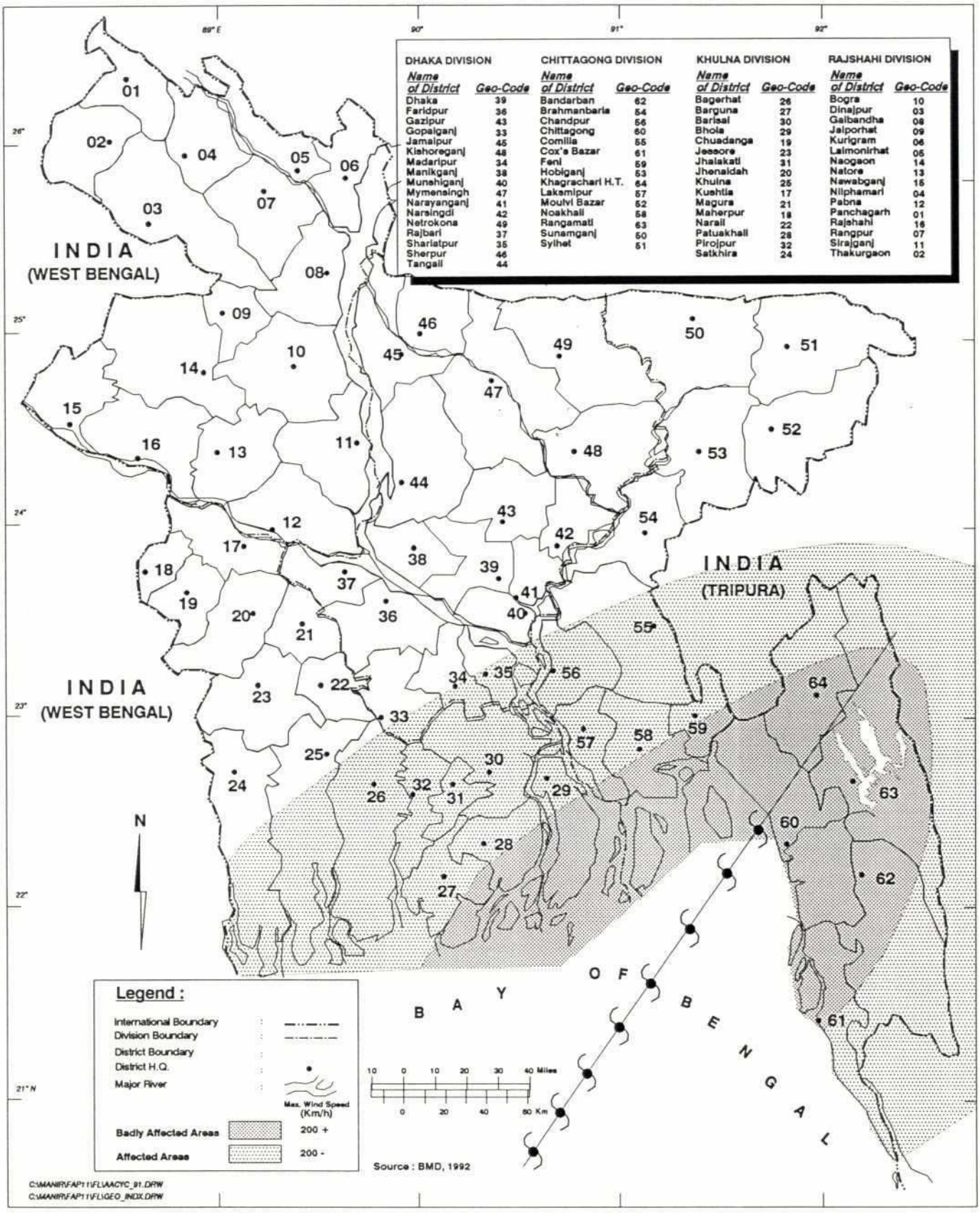
'D' Form

Sl. No	Name of affected people with name of father/husband	Sl.No of Assessment list	No of damaged hous		Approximate Cost	Statement of loss of Cattleheads					No of Duck and Chicken list	Approximate Cost	No of damaged trees	No of damaged fruitbearing trees	Approximate cost	Amount of crops lost per acre	Requirement of relief	Remarks
			Partial	Fully		Sheep	Bufallo	Cow	Goat	Bullock								
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19

Figure 5.2
'D' Form Heading

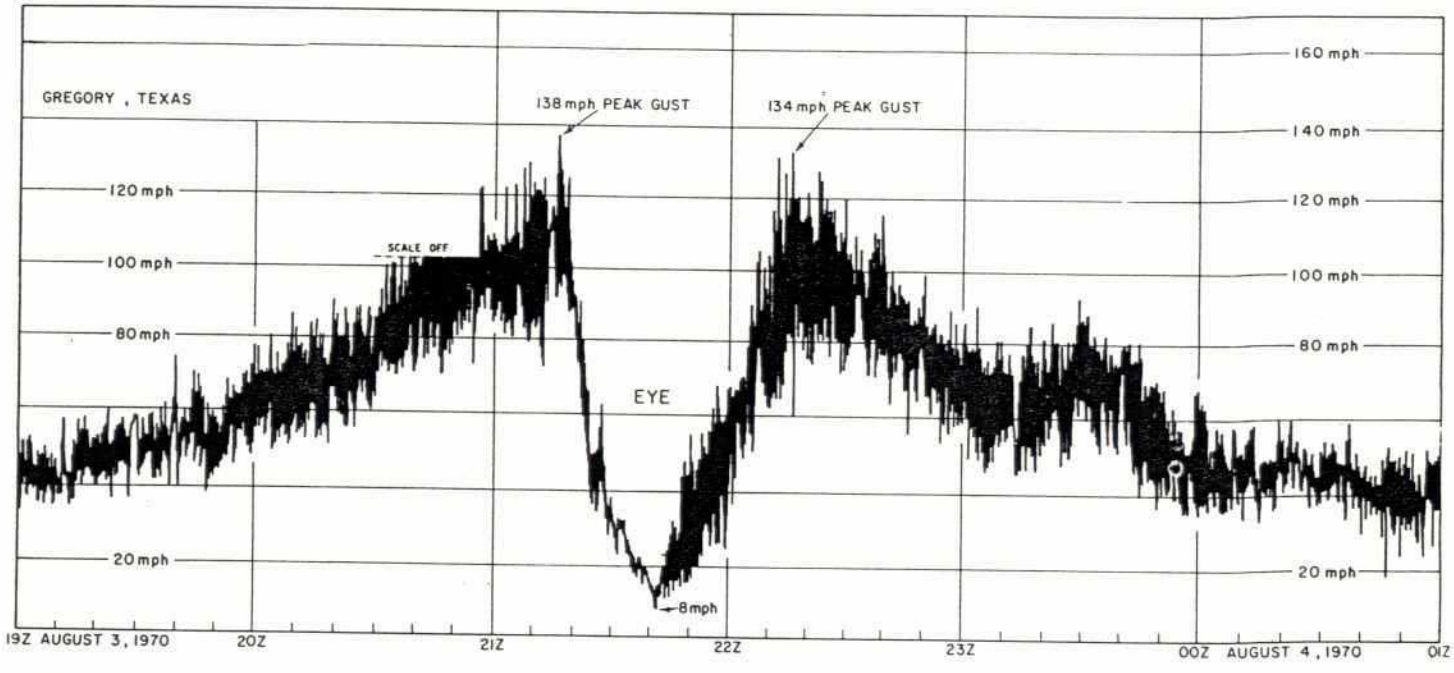
Figure : 5.3

Areas Affected by Cyclone 1991



DHAKA DIVISION		CHITTAGONG DIVISION		KHULNA DIVISION		RAJSHAHI DIVISION	
Name of District	Geo-Code	Name of District	Geo-Code	Name of District	Geo-Code	Name of District	Geo-Code
Dhaka	39	Bandarban	62	Bagerhat	26	Bogra	10
Faridpur	36	Brahmanbaria	54	Barguna	27	Dinajpur	03
Gazipur	43	Chandpur	56	Barisal	30	Gaibandha	08
Gopalganj	33	Chittagong	60	Bhola	29	Jaipurhat	09
Jamalpur	45	Comilla	55	Chuadanga	19	Kurigram	06
Kishoreganj	48	Cox's Bazar	61	Jessore	23	Lalmonirhat	05
Madaripur	34	Feni	59	Jhalakati	31	Naogaon	14
Manikganj	38	Hobiganj	53	Jhenaidah	20	Natore	13
Munshiganj	40	Khagracharl H.T.	64	Khulna	25	Nawabganj	15
Mymensingh	47	Laksmipur	57	Kushtia	17	Nilphamari	04
Narayanganj	41	Moulvi Bazar	52	Magura	21	Pabna	12
Narsingdi	42	Noakhali	58	Maherpur	18	Panchagarh	01
Netrokona	49	Rangamati	63	Narail	22	Rajshahi	16
Rajbari	37	Sunamganj	50	Patuakhali	28	Rangpur	07
Shariatpur	35	Sylhet	51	Pirojpur	32	Sirajganj	11
Sherpur	46			Satkhira	24	Thakurgaon	02
Tangail	44						

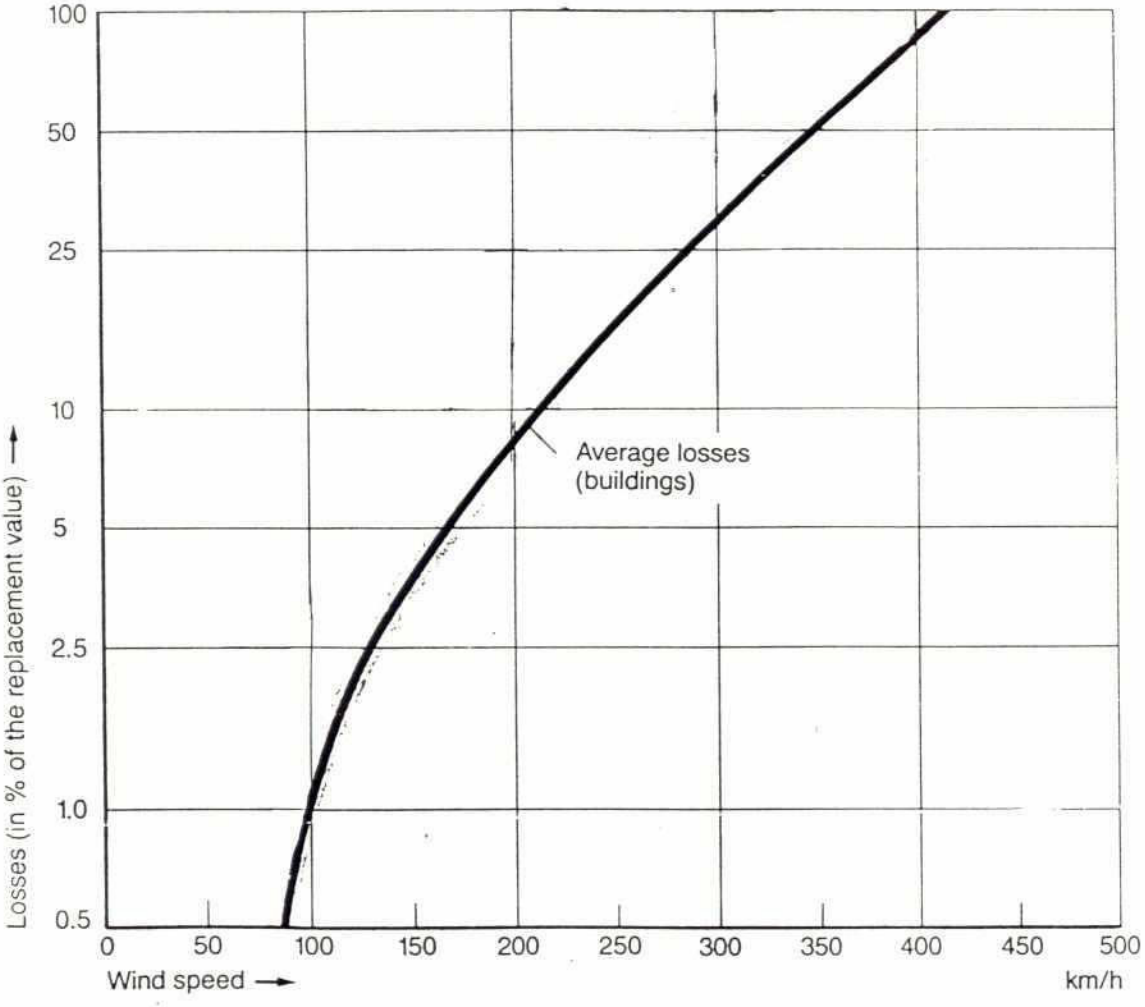
Figure 5.4
Windspeed record for Hurricane (Cyclone) Celia at Gregory, Texas, USA



Source: Simpson, 1981

Note: The 'eye' passed directly over the Gregory Weather Station.

Figure 5.5
Windstorm Losses



Source: Munich Re, 1988

TABLE 5.4

Bangladesh : Production of Major Crops
(Million Metric Tons)

Year	Rice (M mt)	Jute (M mt)	Wheat (M mt)
1980/81	13.9	0.9	*
81/82	12.6	0.8	*
82/83	14.2	0.9	1.1
83/84	14.5	0.9	1.2
84/85	14.6	0.9	1.5
85/86	15.0	1.6	1.0
86/87	15.4	1.2	1.1
87/88	15.7	0.9	1.0
88/89	15.3	0.8	1.0
89/90	17.9	0.8	0.9
1990/91	*	*	*

Source: BBS, 1990; BBS, 1991
*: data not to hand

TABLE 5.5
Infrastructure Rehabilitation following Cyclone 1991
(World Bank Situation Report updated 5 September, 1991)

Type of Reconstruction	Status	Cost Estimate (US $ million)	Source of Financing	Amount (US $ million)
A. Embankment Work				
(i) Priority Repairs	a) EEC funded consultants for preparation of Cyclone Protection Project (CPP II) have made an assessment of repair wokr in the cyclone affected area. TORs for detailed designs have been prepared. EEC is considering financing TA.	83.0	SFD IDA (reallocation) Japanese Fund EEC (TA) GOB	13.30 23.00 20.00 3.00 2.70
	b) Emergency Repairs under FFW Programme		WFP1/ TBD	15.00 6.0-9.0
ii) Long Term Rehabilitation and Strengthening	a) The TOR of the EEC-funded consultants have been revised to incorporate new investigations which should be undertaken for preparastion of IDA's proposed Cyclone protection project. EEC has provided financing and GOB has approved consultancy contract extension.	TBD	IDA ADB COF (TBD)	
	b) Cyclone shelter project (under consideration)	TBD	IDA COF (TBD)	
B. General Infrastructure				
i) Major Roads - Roads - Bridges - Culverts - Equipment	USAID provided financing (US$ 294,000) through a trust fund with World Bank to engage SMEC Consultants for damage assessment and estimating cost of repairs. ADB cleared TORs SMEC submitted final report on August 15, 1991.	50.54	ADB Japan Netherlands (85 milllion)	37.00 3.50 5.00
ii) LGEB - Feeder Roads - Rural Infrastructure - Pourashavas	Donors met with GOB on September 04,1991 to review SMEC fundings and indicate availability of funds for repari.	52.17	ADB WFP	15.00 4.00
iii) Chittagong City - Pavement - Bridges - Equipment - Local Govt.facilities		12.73		
iv) Chittagong Water Supply		0.29		
v) Inland Water Transport		10.45		
vi) Education - Buildings - Facilities		94.77	ADB UNICEF IDA Sweden EEC (ECU) Germany (DM) Saudi Fund (R)	25.00 6.00 6.00 4.00 10.70 20.00 176.00
vii) Health Facilities - Buildings - Facilities		5.01	Japan UNICEF	2.00 2.00
viii) Electricity Supply (PDB & REB)		23.79	ADB Canada IDA Japan Saudi Fund	10.00 1.00 6.00 5.00 6.00
ix) Railway		3.76	ADB Canada	3.50 0.05
C. Other Infrastructure				
i) Rural Drinking Water Supply & Sanitation - Shallow tubewells - Deep tubewells - Sanitation - Facilities	Shallow and deep tubewells: UNICEF reports that (a) most of the 84,000 cyclone damaged pumps have been repaired and (b) additional UNICEF funds are being sought for repairs to remaining pumps and for sanitation facilities, UNICEF will co-ordinate.	1.0+	UNICEF	
ii) Chittagong and Cox's Bazar Airports - Air.Traffic Control System - Ground Facilities	Repairs have been carried out	N.A. 0.35	US Army Engrs. Japan	
iii) Tele-communication - Replacement of micro walve tower etc.	Under the terms of the MOU dated July 14,1991 between GOB and the Saudi Fund, an amount of Riyals 13 million is available for two telecommunication towers at Chittagong and microwave links at Betbunia and Chittagonog. An IDA mission reviewed status in June and estimated the emergency construction cost as US $ 16.5 million (FEUS)	3.6	Saudi Fund	
D. Chittagong Port	$14.4 million), details are : - Salvage operastion - $ 8.5 m - Navigational Aids - $ 2.4 m - Rehab of Fenders Berths etc. - $ 1.5 m - Cargo Nandling Equipments - $ 3.0 m - Engineering Services - $ 1.3 m Netherlands may finance salvage operations and for remaining work, GOB is expected to request reallocation of savings from ongoing IDA Credit 1247-BD.	16.5	Netherlands 5 million IDA 7.0 milliion Japan to bridge the financing gap (?)	

E. Industry

For this category, assistance is primarily aimed at restoring infrastructures (i.e. roads, electricity and water supply, communications, embankments at EPZ etc.) needed by private and public sector industries. In addition, ADB in providing funds from ongoing projects to assist the Chittagong Urea Plant and Japan is extending financial support directly to the Fisheries sector.

1/ Assistance from WFP under FFW (US$ 33.4 million) available for road and embankment reconstruction which BWDB plans to use mostly on the inner embankments. Part of its (App. $15 million) will be used for the northern embankments of the priority Works Programme.

Afforestation on foreshore adjacent to shrimp ponds. Moheskhali
3 June 1992

"Killa", Moheskhali 3 June 1992

5.4 Review of existing Procedures and Organizational Structures for Disaster Management (Objective 2)

5.4.1 Evaluation of disaster-related procedures

(a) Codes

Two sets of Standing Orders are fairly widely available:

- Standing Orders for Floods (RRD, 1984)
- Standing Orders for Cyclone (MORR, 1985)

The latter superseded the earlier Cyclone Code (GOEP, 1970).

In addition, a detailed "Flood and Cyclone Code" was issued by MOA for its staff in 1981 (in Bangla based on an English text prepared in 1980). It is understood that a Drought Code was issued by MOA in 1980, but no copy of this, nor the earlier, more general Bengal Famine Code (GOI, 1913) or Famine Manual (GOI, 1941) has yet been located.

In visiting GOB agencies, it has been found that the existence of the Cyclone and the Flood Codes are known, but few officials visited have been able to actually produce a copy. Many have been pleased to receive a copy of those sections of the Codes that relate to their agency. To date, no agency has been able to produce an Action Plan for their organisation although most seem quite clear as to what they and their agency should do in the event of a disaster.

The findings of an initial review of the Flood and Cyclone Codes are presented in **Annex H.** Aspects identified or requiring further review and discussion are:

- The relevance of the many small differences of provisions and language between the two Codes, the extent to which it would be possible and appropriate to standarize between the two.
- The definitions of the different "stages", and in particular the apparent inconsistency in the use of "disaster stage" within and between the two Codes.
- The precise functions, inter-relationships, and lines of communication between the various co-ordination committees and control rooms.
- The arrangements and criteria for assessing damage and needs, and related reporting forms and procedures.
- The existence, or otherwise, of Action Plans within each of the concerned ministries, divisions and agencies, and the compatibility between such Plans and the Standing Orders.
- The up-dating required as a result of restructuring of government bodies (e.g. creation of new ministries) and/or changes in government policy (e.g. privatization of certain functions).
- The role of the Divisional Commissioners.

- Responsibilities for preparedness planning and emergency response at district level and below following the abolition of the district councils, upazila and union parishads (and associated development committees).
- Clarification of the definitions of "storm intensity" (in terms of wind speeds) corresponding to the various danger levels in the storm warning system:
- Clarification of the processes for notifying the bodies/officers on the various address lists ("whirlwind", "hurrricane", etc.) of storm warning signals.

In addition there is a need for:

- more emphasis on preparedness activities including stockpiling, practice drills, improved flood warning systems;
- the role of NGOs to be addressed;
- wider, regular dissemination;
- related training activities during induction and in-service courses for government officers, for NGO personnel, and at grassroot level.

(b) Wind Storm Warning System

The Bangladesh Meteorological Department (BMD) is responsible for forecasting windstorms and issuing warnings from its Storm Warning Centres (SWC) in Dhaka.

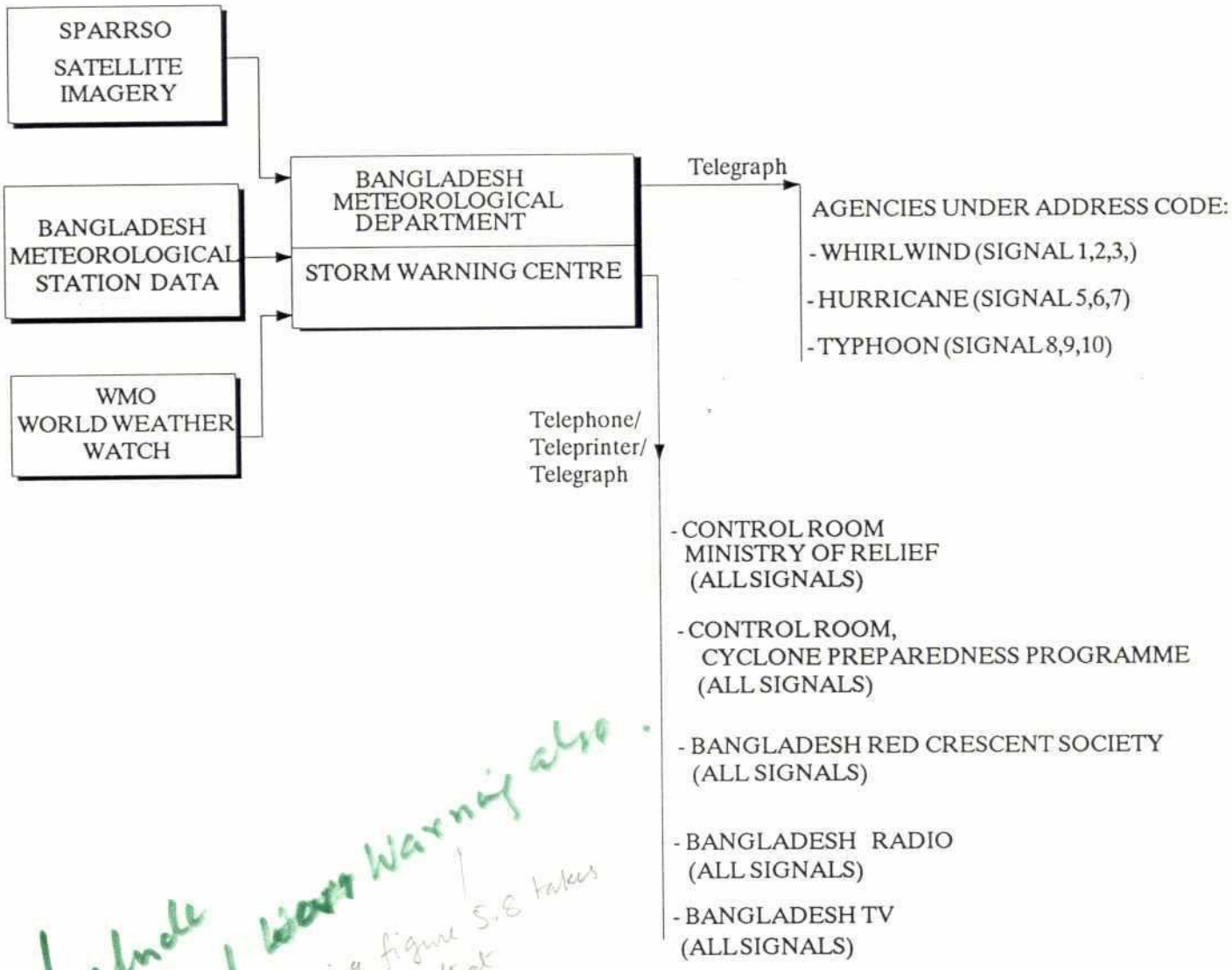
BMD receives meteorological reports from stations throughout the region via the WMO World Weather Watch and Tropical Cyclone Projects. BMD operates two weather radar installations at Cox's Bazaar and Kalapara and SPARRSO regularly provides images from the orbiting US:NOAA satellite. On the basis of these data BMD make predictions of windstorm tracks and issues warnings as prescribed in the Standing Orders (MORR, 1985) **Figure 5.6** indicates the agencies concerned.

The existing windstorm and 'cyclone' warning system, outlined on **Table 5.6** is often criticised as being inappropriate for the inhabitants of the affected areas as it has been developed for mariners and port officials. However, the most detailed field study reviewed to date (CDL, 1992) following Cyclone 1991, indicated that some 91 percent of the population surveyed claimed to have understood the warnings. The warnings that were issued by the BMD for Cyclone 1991 are listed in **Table 5.7.**

A number of reports prepared following the 1991 Cyclone, including an assessment undertaken for the BDRCS, have called for the warnings to be simpler and more persuasive for the general population in the coastal areas.

One aspect of the present warning system that is clearly unsatisfactory is that it makes no distinction between 'weak' cyclones with maximum windspeeds of 118 km/hr, which are unlikely to cause much damage, and those with much higher windspeeds which do. The Saffir Simpson Scale is used in many countries subject to cyclones and its introduction, or that of the International Hurricane Scale (IHS), in Bangladesh will be considered (WMO, 1989).

Figure 5.6
Windstorm Forecast and Warning Dissemination System



Include Flood Warning also.
following figure 5.8 takes care of that

TABLE 5.6

Bangladesh: Wind storm and 'Cyclone' Warning System for the Coastal Ports

Action Stage	GOB/BRCS Signal flag hoisted (nr)	Bangladesh Meteorological Department Warning System		
		Signal	(nr)	Description
Pre disaster	--	--	--	--
Alert	1	Distant Cautionary Signal	I	There is a region of squally weather in the distant sea where a storm may form.
	1	Distant Warning Signal	II	A storm has formed in the distant sea
	1	Local Cautionary Signal	III	The port is threatened by squally weather
Warning	2	Local Warning Signal	IV	The port is threatened by a storm but it does not appear that the danger is as yet sufficinetly great to justify extreme precautionary measures.
Disaster	2	Danger Signal	V	The port will experience severe weather from a storm of slight or moderate intensity, that is expected to cross the coast to the south of the port in case of Chittagong and Cox's Bazar and to the east of the port in case of Chalna.
	2	Danger Signal	VI	The port will experience severe weather from a storm of slight or moderate intensity that is expected to cross the coast to the north of the port in case of Chittagong and Cox's Bazar and to the west of the port in case of Chalna.
	2	Danger Signal	VII	The port will experience severe weather from a storm of slight or moderate intensity that is expected to cross over or near the port.
	3	Great Danger Signal	VIII	The port will experience severe weather from a storm of great intensity that is expected to cross the coast to the south of the port in case of Chittagong and Cox's Bazar and to the east of the port in case of Chalna.
	3	Great Danger Signal	IX	The port will experience severe weather form a storm of great intensity that is expected to cross the coast to the north of the port in case of Chittagong and Cox's Bazar and to the west of the port in case of Chalna.
	3	Great Danger Signal	X	The port will experience severe weather from a storm of great intensity that is expected to cross over or near to the port.
Post disaster	--	Failure of Communication	XI	Communication with the Meteorological Storm Warning Centre have broken down and the local officers consider that a devastating cyclone is following.

Source : MORR, 1985

TABLE 5.7
Cyclone 1991 : BMD Warnings

Warning Nr.	Issue of Date	Warning Time (BST)	Windstorm Status (1)	Distance from Chittagong (km)	Meteorological Warning Signal Nr.		
					Chittagong	Cox Bazar	Mongla
1	25.04.91	11:20	D	1400	1	1	1
2	25.04.91	13:50	D.D.	1240	1	1	1
3	26.04.91	05:00	C.S.	1220	2	2	2
4	26.04.91	09:30	C.S.	1220	2	2	2
5	26.04.91	18:15	C.S.	1220	2	2	2
6	26.04.91	16:40	C.S.	1220	2	2	2
7	26.04.91	19:15	C.S.	1215	2	2	2
8	27.04.91	05:00	C.S.	1215	2	2	2
9	27.04.91	09:40	C.S.	1180	2	2	2
10	27.04.91	13:35	C.S.	1120	2	2	2
11	27.04.91	15:15	S.C.S.	1060	2	2	2
12	27.04.91	19:30	S.C.S.	1020	2	2	2
13	28.04.91	04:40	S.C.S.(H)	960	2	2	2
14	28.04.91	10:25	S.C.S.(H)	900	3	3	3
15	28.04.91	14:20	S.C.S.(H)	820	4	4	4
16	28.04.91	19:40	S.C.S.(H)	750	4	4	4
17	28.04.91	21:30	S.C.S.(H)	700	6	6	5
18	29.04.91	15:10	S.C.S.(H)	610	6	6	5
19	29.04.91	09:00	S.C.S.(H)	520	10	9	8
20	29.04.91	12:30	S.C.S.(H)	450	10	9	9
21	29.04.91	15:00	S.C.S.(H)	360	9	8	8
22	29.04.91	16:20	S.C.S.(H)	300	10	9	8
23	29.04.91	19:30	S.C.S.(H)	225	10	9	8
24	29.04.91	21:15	S.C.S.(H)	160	10	9	8
25	29.04.91	23:10	S.C.S.(H)	96	10	9	8
26	30.04.91	00:40	S.C.S.(H)	72	10	9	8
27	30.04.91	02:20	S.C.S.(H)	Crossing the Ctg.CoxB coast	10	9	8
28	30.04.91		S.C.S.(H)	Crossing the Ctg.CoxB coast	10	9	8
29	30.04.91	06:20	S.C.S.(H)	Crossing the cross near Ctg.	3	3	3

Source : BMD, 1992

Notes: (1)
- D – Depression
- DD – Deep depression
- CS – Cyclonic storm
- SCS – Severe cyclonic storm
- SCS(H) – Severe cyclonic storm with a core of hurricane force wind

Cyclone
Preparedness
Programme.
Demonstration
'Two flag' signal
which corresponds to
BMD Signal Nos 4-7

4 June 1992

Cyclone Preparedness Programme
Warning and Safety equipment 4 June 1992

Table 5.8 indicates the order of magnitude of surge heights for various windspeeds. It is the surge that has proved to be the killer in Bangladesh. Warnings should be developed so that the coastal population know that a cyclone of significant magnitude is likely to strike, with for example a windspeed of above 170 km/hr and a surge height of 2.5 m. This will be developed further as the project progresses.

Another aspect of the present windstorm warning system that might require further examination relates the river ports. The river port warning system is given on **Table 5.9.** A similar signal numbering system is used as for the coastal ports but signals of the same number mean different things. However, no reports of confusion have been found yet.

The dissemination of BMD warnings to the radio and TV and through official channels, has been supplemented since 1973 by the GOB/BDRCS Cyclone Preparedness Programme (CPP). The CPP headquarters in Dhaka has direct radio contact with BMD and with its own personnel at zonal and upazila levels, and in some unions. The CPP presently has some 21,000 volunteers organized in units of ten.

The CPP is established in 24 Upazilas in the coastal area (see **Figure 5.7)** and arrangements are in hand to extend this to another six as well as to replace much of the equipment and retrain the personnel. However, the proportion of the population that quoted the CPP as the source of Cyclone 1991 warnings was disappointingly low (CDL, 1992).

A number of suggestions have been made to increase the involvement of upazila and union-level officials and representatives, plus teachers and Imams, in the CPP process. In at least one area, Hatia, the CPP staff and volunteers have apparently taken the initiative to integrate their CPP activities into wider local development initiatives.

(c) Flood Warnings

The BWDB Flood Warning Centre (FWC) is responsible for forecasting floods and issuing warnings.

The FWC receives data from a network of 43 river and 48 rainfall observation stations within Bangladesh. It also receives data from the BMD both for meteorological stations within Bangladesh and for river and rainfall stations in neighbouring countries through the WMO World Weather Watch programme.

Satellite images are also received from SPARRSO. Using mainly the MIKE 11 computer software, which has been developed with UNDP assistance (BGD/88/013 : Improvement of Flood Forecasting and Warning) FWC make predictions of river levels for 16 locations for the following 24 and 48 hours periods. These predictions are disseminated as detailed in Figure 5.8.

A detailed review of the existing system has recently been made by WMO and

proposals for improvement prepared (Kachic, 1992). These are under five headings:

- forecasting operations and processing
- dissemination
- Flood Bulletin
- Daily Bulletin
- training

The aim of these proposals is to ensure that the populations likely to be affected by floods are informed in a timely manner and in a form that they understand.

The desireability of producing forecasts, hence warnings, of the particular areas threatened by flooding to specified depths has been emphasized by a number of persons and reports consulted. There are considerable technical difficulties related to producing the required predictive models. The UNDP-funded Flood Forecasting project (BGD/88/013 -- FAP.10) will terminate shortly, but a three-year extension is being proposed to address this need. Subject to funding being secured, it is understood that it may be possible to produce useful results in two or three years.

Suggestions have been made for the establishment of an equivalent to the CPP for the flood prone areas, but others consider this would not be appropriate and that more broadly based community arrangements should be envisaged.

5.4.2 Assessment of existing and proposed Organisational Structures for Disaster Management

During discussions with a number of the individuals and organisations visited (see **Annex I**), and during the informal Workshop, the need for, role and position of the proposed ODM has been explored. The issues raised have included :

- deficiencies of the present arrangements
- respective roles of the proposed ODM, MOR control Room, and DCMU
- perceived lack of coordination at various levels
- liaison between the civil administration and the armed forces.

These issues will continue to be investigated.

5.4.3 Assessment of Disaster Management Training Needs and Resources

Many of the people consulted, and a number of the reports reviewed, have emphasized the need for training of personnel at all levels. However, precisely what training is needed by whom, who should give it, and who should pay for it, is rarely defined. In fact, a significant number of people are known to have received disaster management training abroad in recent years through secondments to courses at:-

- Asian Disaster Preparedness Centre (ADPC), Bangkok, Thailand
- Cranfield Disaster Preparedness Centre (CDPC), RMCS, Shrivenham, England
- National Research Centre for Disaster Prevention, Tokyo, Japan
- Administrative Staff College, Hyderabad, India

Figure : 5.7

Cyclone Preparedness Programe

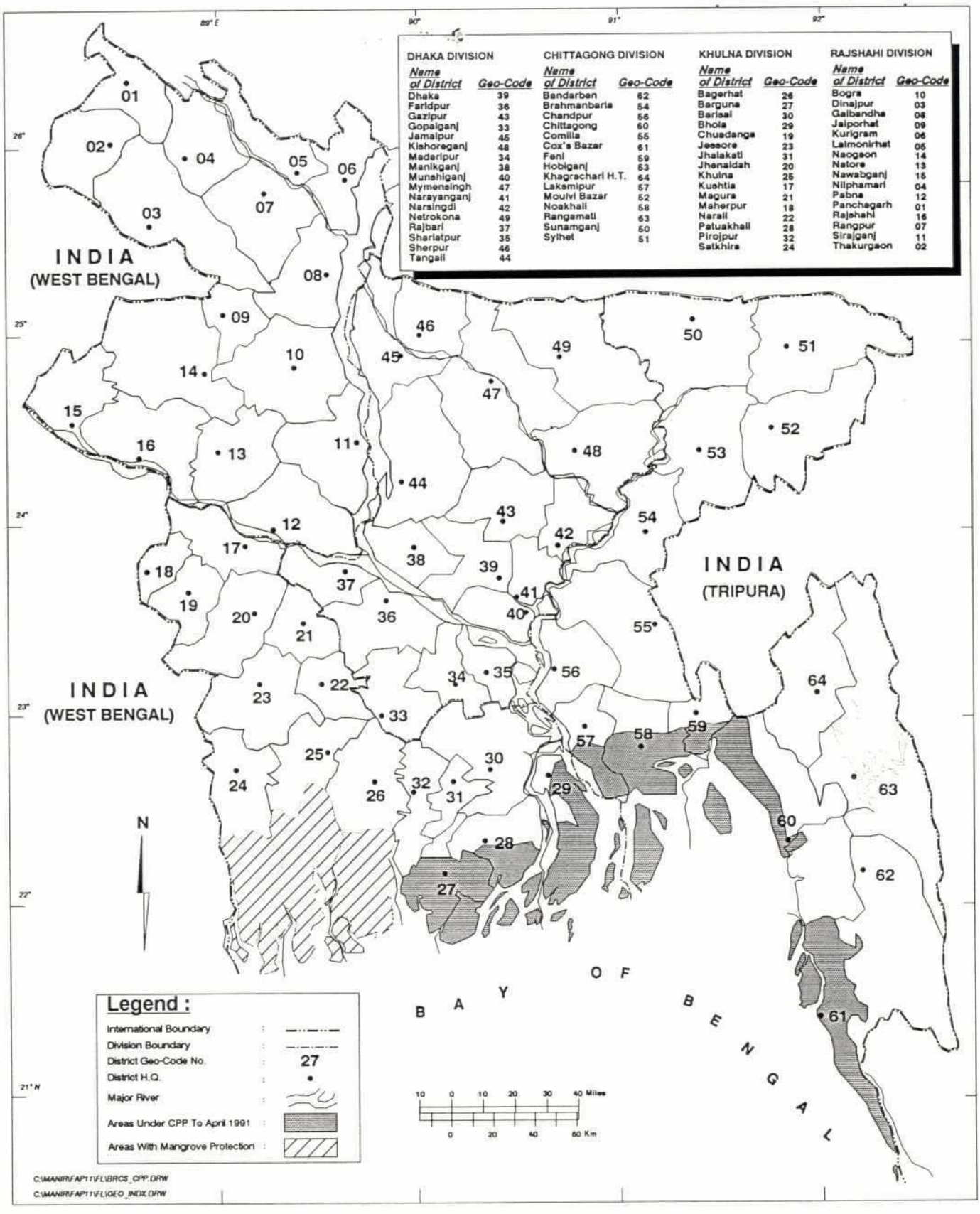
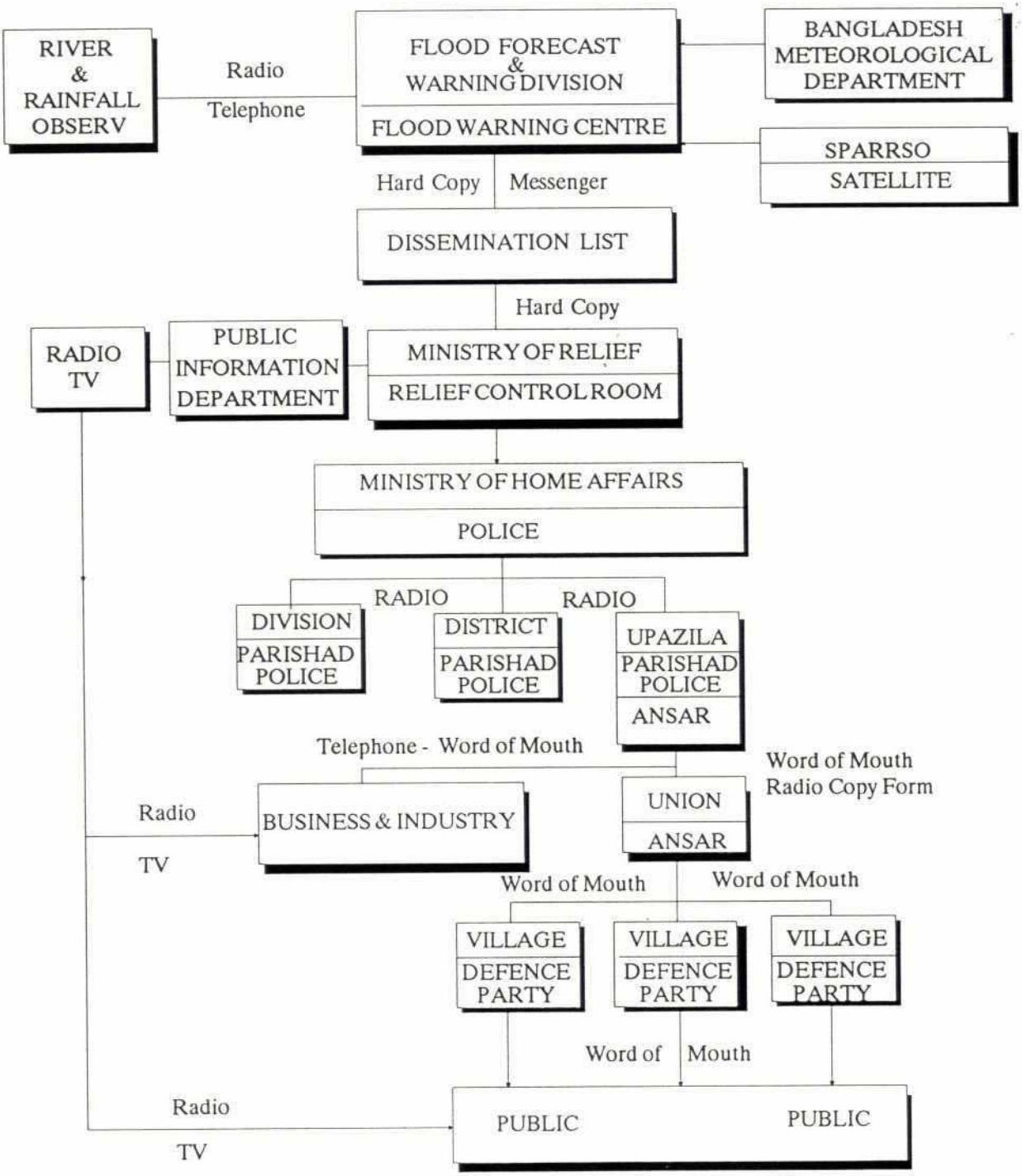


Figure 5.8
Flood Forecast and Warning Dissemination System



Source: BWDB/FWC

TABLE 5.8

Windspeeds and Estimated Surge Heights

Windspeed (km/hr)	Estimated Surge height (m above 'normal' level)
118	1.25
153	1.65
177	2.55
195	3.85
233	5.55

Source: WMO, 1989

TABLE 5.9

Bangladesh : Windstorm Warning System for River (inland) Ports

Signal	Nr	Description
Cautionary Signal	I	The area is threatened by squally winds of transient nature.
Warning Signal	II	A storm is likely to strike the area (vessels of 65 feet and under in length are to seek shelter immediately).
Danger Signal	III	A storm will strike the area (all vessels will seek shelter immediately).
Great Danger Signal	IV	A violent storm will soon strike the area (all vessels will take shelter immediately)

Source: MORR, 1985

Personnel from the armed forces, the civil administration, line ministries and some academic/training institutions, as well as NGOs, have attended these courses. It is possible that people have also received training at other centres, such as Oxford Polytechnic (UK) and University of Wisconsin (USA).

In addition, a few disaster management courses have been offered in Bangladesh, in recent years. These have been mostly short courses for the personnel of individual agencies, but some with a wider intake have been included. Several independent bodies have established themselves in Dhaka within the last year

offering, or proposing, specific training in disaster management. These include:-

- South Asia Disaster Management Centre (SADMC), IUBAT, Green Road, Dhaka (1 course offered with the collaboration of ADPC in 1991).
- Bangladesh Disaster Preparedness Centre (BDPC), Mohammedpur, Dhaka
- Disaster Resource Unit, Bangladesh Development Partnership Centre (DRU/BDPC), Dhanmondi, Dhaka

A number of other institutions, such as the Institute of Business Administration (INBAT), University of Dhaka might also be interested in arranging courses, and the Director CDPC has made a proposal to collaborate in establishing a Disaster Preparedness Centre within the Bangladesh Public Administration Training College (BPATC), subject to UK/ODA funding. ADPC has also indicated a willingness to provide technical assistance to training activities organized by in-country institutions, in addition to the training courses provided in Bangkok.

Within the NGO community, a number of initiatives have been taken, most notably those of ADAB/PACT-PRIP/IVS including a workshop on "disasters and development". This was based on the internationally-renowned material prepared by the International Relief/Development Project, Harvard University, and was conducted with the participation of one of the original author/trainers, P.J. Woodrow. They have also prepared other training materials, and a 6-day course on disaster preparedness. A complementary manual is about to be published. The current materials include a book/teaching aid for use at village level in flood-prone areas, which has been distributed by the NGO Bureau to local administrations, but the pilot training session (in Manikganj) has not yet followed up elsewhere.

BRAC is planning disaster management training for 200 of its staff. CARE is envisaging arranging in-depth training for its own staff, and offering training to other, small indigenous NGOs. VHSS are likely to be developing some form of training. There are undoubtedly other initiatives of which the project are not yet aware. The International Institute for Environment and Disaster Management (IIEDM) is also proposing to develop a disaster handbook, but has not (yet) proposed any specific training courses.

The BDRCS/CPP has provided specific training for its staff and volunteers on a regular basis over the last twenty years, albeit with a tightly constrained overall budget. The training is necessarily focused on the specific tasks related to the functioning of the cyclone warning and preparedness system, but has some additional elements also. The BDRCS is now assured of substantial funding from the international Red Cross movement, through the IFRCS, to revitalize its training programme and to train a large number of additional volunteers. Italian

Cooperation and WHO are collaborating in the training of volunteers in Banshkhali.

It has not yet been possible to build up a complete inventory of these activities and resources, but arrangements are in hand to circularize a wide range of organizations to request information on persons who have received training and on the courses presently offered. This will help to identify the resources available. An attempt may also be made to estimate the effectiveness of the training activities, and the Bangladesh-specific materials currently available.

As regards training needs, it is clearly too early to make any specific suggestions, but it is apparent that training should be envisaged for planning and operational personnel at all levels-- national, district, upazila and union--and that this must be specifically focused on the responsibilities of, and possibilities for action by, the various groups concerned. Joint training of personnel from government, the armed forces, and NGOs, should also be envisaged: people who have trained together will work together more easily and more effectively when the time (a crisis) comes. Training must also be complemented by a relevant public education effort. Several observers have specifically mentioned the need to include relevant material in the primary school curriculum.

① We support - and suggest that ↓

During discussions, the Additional Inspector-General of Police spontaneously proposed the inclusion of a disaster management module, of perhaps one week duration, in the basic training courses provided for police officers and constables. A similar suggestion has been made by the Director-General of Fire Services and Civil Defence. The inclusion of relevant "modules" in many of the induction and in-service courses provided for government officers of various departments and VDP volunteers would appear to be both desirable and feasible. A similar possibility will also be discussed with the Imam Training Centre of the Islamic Foundation.

In terms of training at grassroots (village) level, the Village Volunteer Programme (VVP), supported by IVS inc., apparently includes some elements of disaster preparedness in the training provided to its community organizers and, through them, to village-level associations. BRAC, with support from UNICEF, is planning a community awareness programme in the coastal area. There are believed to be a few other, similar NGO-supported activities in particular areas. Such activities, in which disaster preparedness is dealt with within the framework of broader local-level devewlopment activities, could be particularly effective and worthy of support and encouragement. On a similar basis, there could be great potential in introducing relevant elements (modules) into the training offered to elected and other union-level officers. The World Food Programme (WFP) has been promoting such training in conjunction with LGEB and other bodies. The Academy for Rural Development (BARD), Comilla, and the Local Government Training Institute, could also be involved.

It is proposed to pursue further enquiries with the potential users, contributors, and organizers of disaster-related training, and to convene a small working group shortly to exchange ideas concerning the priority target groups for training, their specific training needs, the resources already available, and the approaches which could be adopted.

① - in addition, may consider preparing and updating a roster of persons trained and areas of specialization
- extramural drills for school children including recognition of warning signals, keeping a weather eye open to changes in status, disciplined evacuation so on and so forth
- training of volunteers from higher secondary school / colleges

5.5 Preparation of FAP:11 Comprehensive Disaster Preparedness Project (Immediate Objective 3)

A preliminary review of the existing draft project document, prepared by a UNDP/UNDRO Consultant (Oakley, 1990) has been undertaken. Through review and revision of this document will be undertaken following the completion of further work on other project activities, notably those relating to objective 2 (see 5.4 above).

5.6 Concept Plan for Integrated Coastal Protection (Immediate Objective 4)

The first visit of the Coastal and Hydraulic Engineering Specialist (CHES) has been completed and his findings are contained in **Annex F.**

The concept plan will take into account the following basic policy objectives:

- prevention of loss of life
- prevention of damage to valuable infrastructure
- economic protection of productive land areas
- preservation of mangroves and other environmental resources.

The elements of the Plan are already fairly clear and are in various stages of planning and implementation. They can be summarised as:

- sea facing and similar embankments plus afforestation
- multipurpose shelters and 'killas'
- cluster villages and house strengthening, water supply and electricity
- transport systems (roads,helipads,drop zones,landing strips,waterways and landings/jetties),
- medical facilities
- warning/communication for cyclones
- landuse planning and land registration

An emergency one-year project is being implemented for the construction of priority sea facing embankments. This will be followed by further embankment construction, which is due for completion in mid 1995. Afforestation of the embankment forelands is to be implemented in parallel with embankment construction.

Various developments are underway for the construction of further cyclone shelters, (see **Table 5.10**). At the same time, a master plan study (BUET, 1992) will be completed by July 1992 and provide the standards and framework for a comprehensive network of cyclone-proof multi purpose shelters. Associated measures including 'killas', afforestation, and services, are being covered by the study.

Many needs and ideas have been put forward for the strengthening and improvement of transport systems, cyclone warning systems, village housing, medical services, water supply and electricity. These are discussed in Annex-F.

The need is for effective coordination of the separate initiatives and further study of the many proposals that are only at the 'idea' stage. The essential characteristic of multi purpose performance of protective measures is generally accepted. This, together with local participation by those living in the coastal

TABLE 5.10
Cyclone Shelters and Schools-cum-Shelters

Responsible	Funded by	Completed by 30th June 1991	Planned for completion by 30th June 1992	1993	1994	1995	1996
PWD	?	100 (1)	100	100	100	100	100
PWD	IDA	238	238	238	238	238	238
BDRCS	Various	62	102	162	227	227	227
CARITAS	Various	12	37	67	110	162	162
LGEB	Japan	0	0	20	40	40	40
MOE	Saudi Fund	0	0	100	200	200	200
MOE	Japan	0	0	20	40	60	60
MOE	EC	0	0	60	130	200	200
CCDB	Various	0	0	25	50	75	100
Grameen Bank	Self ?	0	0	10	20	20	20
BRAC	Self ?	0	0	8	16	16	16
CHCP	Various	0	0	1	2	3	3
Other NGOs	Various	0	0	40	80	120	160
	Total	**412**	**477**	**851**	**1253**	**1461**	**1526**

Sources : BUET, 1992, CARITAS, 1991; BRCS, 1992

(1) Coastal and sub-coastal community centres built in 1960s, largely abandoned (BUET, 1992).

c:\lotus\incept\tab-cyc1.wk1

areas and depending on the measures for their survival, must be the two underlying criteria to be met, wherever possible.

The effective integration of measures in different sectors calls for inter-ministerial policies and decision-making. For this to be achieved, direction will be needed from a higher level and it has been suggested that the appropriate level might be the Planning Commission or the Cabinet Office.

5.7 Telecommunication Investigations

A vital element in any disaster preparedness and response system is communications and, in preparing the Project Document, GOB/UNDP recognised that the MOR communication systems required strengthening. A sum of US$125,000 is allowed for the procurement of communications equipment during the course of this Project.

Two months of local Visiting Consultant time has been allocated to studies related to telecommunication. These studies, which are well advanced, are to:

- inventory the existing systems within the country
- review their performance during recent disasters, with special reference to Cyclone 1991
- make proposals for necessary upgrading
- consider the necessity for changes in legislation

The TOR for the studies are included in **Chapter 6** while a report on findings to date is given in **Annex E.**

CHAPTER 6

WORK PLAN AND STAFFING

6.1 Introduction

The proposed (revised) workplan is presented in this Chapter, together with the related staffing schedule.

The modifications as compared with the original workplan and staffing schedule do not entail any requirement for extra funding or delays in Project completion.

6.2 Revised Workplan

Figure 6.1 shows the revised workplan which takes account of the the discussion and suggested interpretation of the Project TOR given in Chapter 5.

The Project outputs would be as originally proposed with the addition of a Training Report which would cover the assessed needs, the proposed training strategy, and a summary report on initial training activities related to disaster management.

The proposed dates of the various outputs are in general conformity with the original programme, except that the issue of the draft FAP:11 document would be delayed by two and a half months to mid October 1992. The reason for this is that the original submission date, only two months after the effective start date of the assignment would not give sufficient time to prepare what is in many respects the most important Project output.

6.3 Staffing Schedule

Figure 6.2 shows the revised staffing schedule. The basic inputs of the international and local consultancy contracts are substantially as in the respective contracts with OPS. However, certain areas have been identified where additional specialist inputs are required.

a) International Experts

Five man months of unallocated international expert time are provided for in the Prodoc. It is proposed to utilise three as detailed below leaving two months in reserve for unforeseen requirements:-

i) one additional month of Disaster Management Specialist during January 1993 to assist with the consolidation of the work of the Project/DCMU in preparing the final report and laying a sound basis for follow on under FAP:11, with particular

- the process of defining the improvements to be made to the Standing Order and assessment of procedures;

- the integration of these activities with those of other concerned government and non-governmental bodies.

Objective 1
Strengthening of Government capability to co-ordinate and monitor disaster related activities, through the Ministry of Relief

Output 1.1
Establishment of an effective unit within MOR with initial management information and related systems
1.1.1 Establishment of the precursor to the Office of Disaster Management
1.1.2 Formulation and setting up of a Management Information System
1.1.3 Developing data gathering, consolidating and analysis systems
1.1.4 Developing data collection and reporting formats
1.1.5 Training in all procedures

Output 1.2
Effectively prepared damage assessments
1.2.1 Identify deficiencies in previous damage assessments and make proposals for future effective assessments
1.2.2 Provide advice and where necessary propose assistance to concerned agencies

Output 1.3
Assessment of repair and rehabilitation efforts following the 1991 cyclone
1.3.1 Assit MOR in the prepration of reports on the progress of repair and rehabilitation following the 1991 cyclone

Objective 2
Review Existing Procedures for Disaster Management, Assess the need for and functions of an Office of Disaster Management and Assess Training Needs and initiate training

Output 2.1
Effective emergency procedures
2.1.1 Review and analysis of effectiveness of existing orders, codes and procedures
2.1.2 Propose modifications to existing orders and the like together with consideration of new options

Output 2.2
Assessment of organisational structures and an outline for duties and staffing for an Office of Disaster Management
2.2.1 Review organisational structures and arrangements for disaster management and identify deficiencies
2.2.2 Make proposals for an Office of Disaster Management or similar

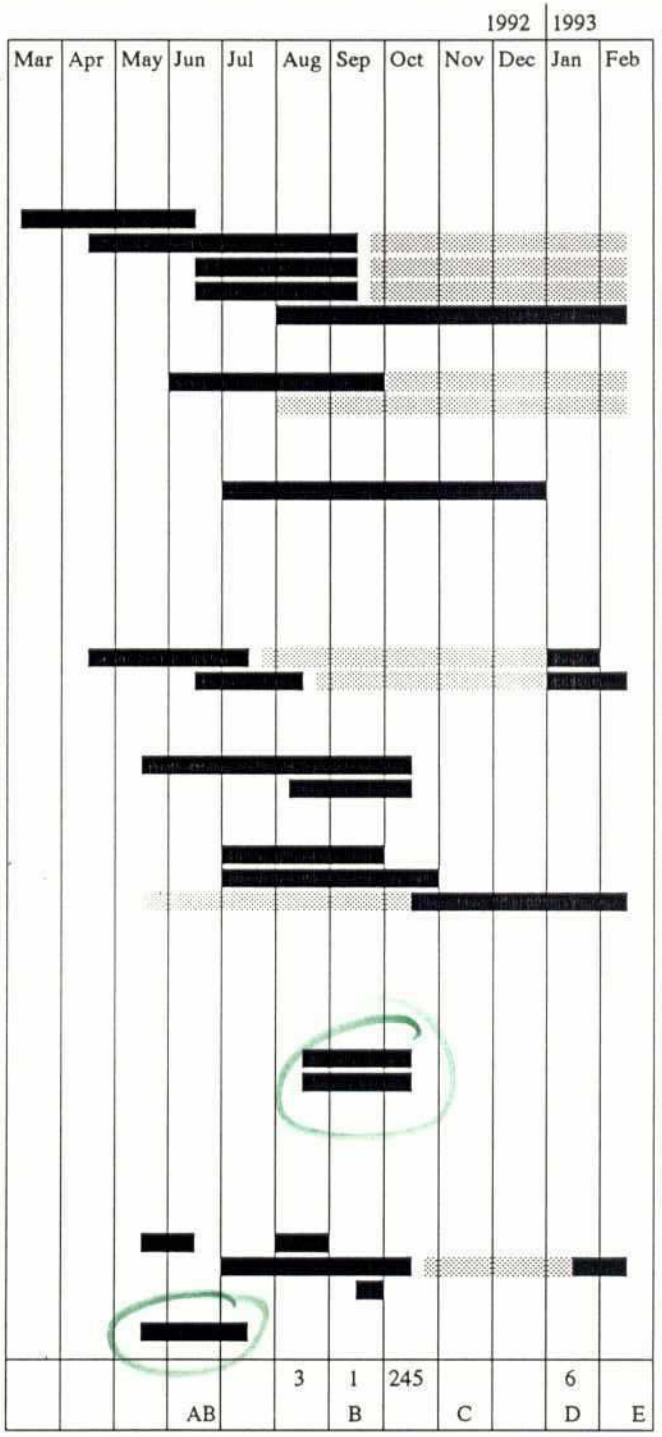
Output 2.3
Effective Training Programmes
2.3.1 Assess training needs of GOB officials and for wider public education
2.3.2 Identify suitable institutions and training materials
2.3.3 Develop an overall training strategy and intitate training

Objective 3
Preparation of Project Document & draft Terms of Reference for FAP Comprehensive Disaster Preparedness/ Management Programme

Output 3.1
Documentation for FAP 11 Comprehensive Disaster Preparedness/ Management Programme
3.1.1 Define technical assistance requirements for the establishment of Office of Disaster Management
3.1.2 Prepare a Project Document for the FAP Disaster Management Programme and assist in the preparation of a technical assistance plan and a project concept paper

Objective 4
Preparation of Concept Plan for the integration of coastal protection measures into other developments

Output 4.1
Concept Plan for integrated coastal protection
4.1.1 Consultation with implementation agencies to initiate an integrated appraoch to coastal protection
4.1.2 Preparation of a structure plan for an integrated programme by function, phase and sector
4.1.3 Identification of multi-sectoral responsibilities for implementation
4.1.4 Review on-going relevant FAP studies and other method studies and propose modifications where considered necessary

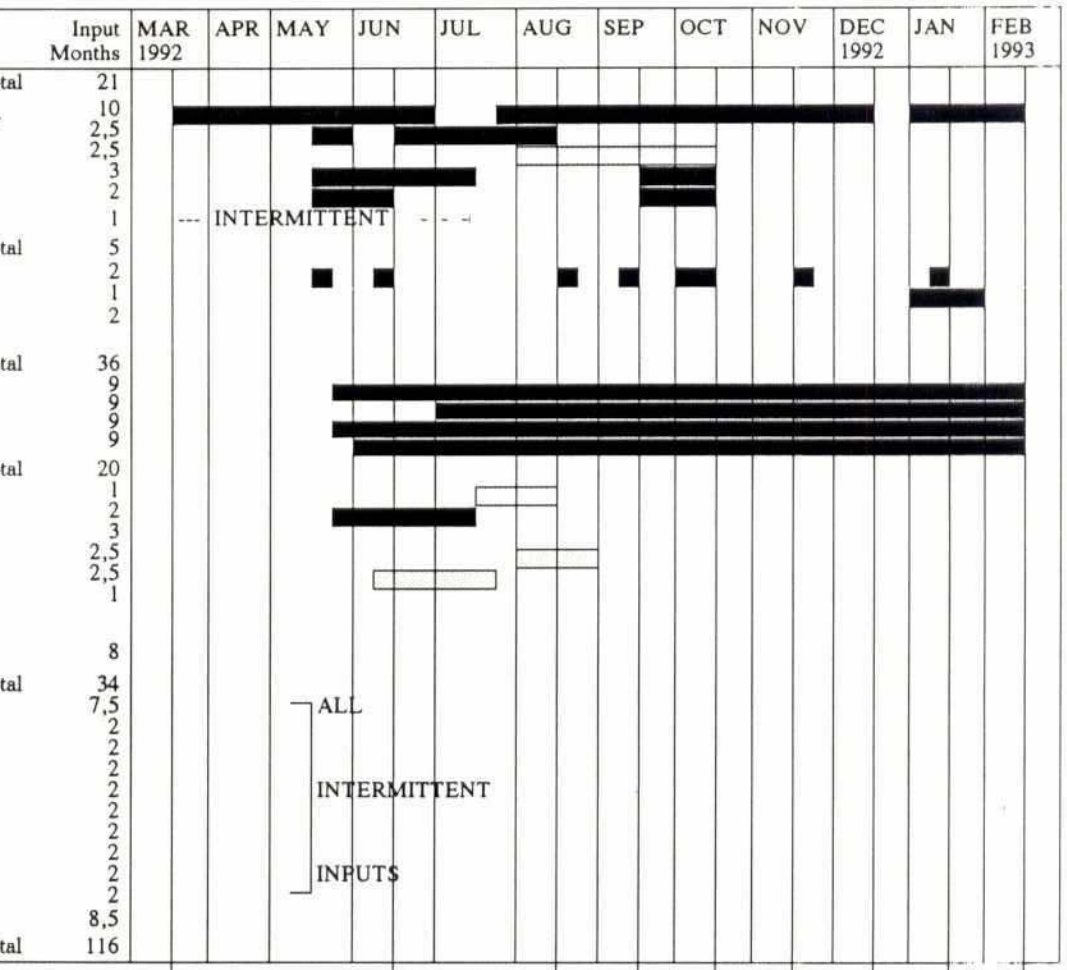


Reports	
A. Inception report	1. MIS Guideline & Formal Report
B. Quarterly Report	2. MIS User Report
C. Status Report	3. Procedures Document
D. Draft Final Report	4. FAP 11 Programme Document
E. Final Report	5. Concept Plan
	6. Training

Full time activities
Part time activities

Figure 6.1
Workplan

Inputs/Outputs	Name	Input Months
1. Mott MacDonald/Asian Disaster Preparedness Centre	Sub Total	21
Team Leader	M P Gillham	10
Management Information System Specialist	S L Marsden/J Repp	2,5
Management Information System Training Specialist	P Ravenscroft	2,5
Disaster Management Specialist	R F Ockwell	3
Coastal and Hydraulic Engineering Specialist	M L A Brett	2
Local Disaster Management Specialist	Saidur Rahman	1
2. Additional Short Term Consultants (to be agreed)	Sub Total	5
Planning and Training Consultant	B Ward/T Jeggle	2
Disaster Management Consultant	R F Ockwell	1
Possible additional disciplines: Risk Analysis, Health/ Nutrition	TBN	2
3. Local Consultants	Sub Total	36
Co Team Leader/Disaster Preparedness Specialist	Syed Ahmed	9
Rural Infrastructure Specialist	Motiur Rahman	9
Natural Resources and Environmental Specialist	Faruk Aziz Khan	9
Management Information System Specialist	Amatur Razzaque	9
4. Visiting Consultants (to be agreed)	Sub Total	20
Public Sector Accounting Consultant	M U Afzal	1
Telecommunications Consultant	Nasiruddin Ahmed	2
Training Consultant	TBN	3
Sociologist/Gender Issues Consultant	Ishrat Shamim	2,5
Agricultural Consultant	Amjad Hossain	2,5
Library Consultant		1
Possible additional disciplines: Flood Control, Costal Engineering, Mass Communications	TBN	8
5. Professional Panel [Selected by GOB/UNDP/TL]	Sub Total	34
Institutions Adviser/ Chairman	Siddiqur Rahman	7,5
Military Adviser	Col. Rahman	2
Coastal Protection (FAP Coordination) Adviser	A Nishat	2
NGO Coordination Adviser	Richard Holloway	2
Rural Infrasturcture Adviser	Monwar Chowdhury	2
Cyclone Shelters/ Structural Adviser	J R Chowdhury	2
Water Resources Adviser	Amjad Hussain Khan	2
Agriculture Adviser	Anwaruzzaman Khan	2
Coastal Fisheries Adviser	A L Sarker	2
Disaster Assessment and Response Adviser	Saidur Rahman	2
Others	TBN	8,5
	Total	116



6. Project Outputs	Due Date
Start date	19 Mar
Inception/ Quarterly Report	20 June
Evaluation of Procedures	20 Aug
Quarterly Report	20 Sep
M&E Guidelines and Formats	20 Sep
FAP 11: Disaster Preparedness Document	20 Oct
MIS User Manual	20 Oct
Concept Plan for Coastal Protection	20 Oct
Status Report	20 Nov
Quarterly Report	20 Dec
Training Report	20 Jan
Draft Final Report	20 Jan
Final Report	20 Feb

Firm
Provisional

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Figure 6.2
Project Staffing Schedule

ii) two months of Planning and Training Specialist input to help define the overall disaster management and training strategies and initiate the training programmes, and in particular :-

- to frame the identified training needs, and assist in two brief training activities determined to be useful and desirable by the Project Team Leader during the course of the project;

- to develop additional disaster management policy insight among senior Bangladeshi advisors and UN or NGO officials affiliated with the project during the course of project activities through discussion and scheduled policy exchanges;

- to conduct an initial brief training orientation in disaster management skills for functional project staff and others;

- to contribute disaster management training sections in the Inception Report and the FAP 11 Document;

- to organise a Study Tour.

(b) Local Experts

The international contractor's Local Disaster Management Specialist has proved to be a vital resource to the Project team. He has originally proposed for a two month input but this was reduced to one upon the request of OPS (UNDP/OPS letter of 11 December 1991). He has already utilised 60 percent of his time in 33 percent of the Contract period. It is suggested that an additional input of two months be provided intermittently over the remaining contract period.

Detailed Terms of Reference for the core team of Local Experts will be as given in the Contract TOR with the following additions:-

The Rural Infrastructure Specialist (RIS) would:-

- review procedures for undertaking emergency and short term repair works including funding, especially the relationship to ADP allocations, design, construction and monitoring.

- assess GOB contributions to 1991 cyclone emergency and short term repair and rehabilitation works.

- assess the extent to which the first priority works identified following the 1991 cyclone damage assessments were completed by 31 May 1992 and, if appropriate, determine when the works will be completed.

- assess the current status of the second priority works identified following the 1991 cyclone damage assessments.

- assess the extent to which the emergency works have been coordinated by ERD following the WBRM meeting of 4 September 1992.

- determine the accuracy of damage assessments made by SMEC and others on the basis of the actual works carried out.

- review Design Codes presently used in Bangladesh in the light of windspeeds experienced during cyclones and the associated risk of flooding from storm surges and, if required, propose changes to the Codes.

The Natural Resources and Environmental Specialist (NRES) would:-

- collect, review and catalogue published data and maps onkthe areas affected by particular cyclones, floods, and tornadoes, and those subject to particular levels of seismic risk.

- in close consultation and collaboration with the agricultural specialist, collect, review and catalogue published data and maps on the areas which have been affected by droughts resulting in severe crop shortfalls.

- identify and attempt to resolve/reconcile any inconsistencies in the published data by referring back to original sources and/or consulting with relevant experts.

- prepare hazard maps of Bangladesh at a scale of 1:1,000,000 for cyclones/storm surges, extensive river floods, flash floods, tornadoes, earthquakes, and droughts, following the guidelines provided in Mitigating Natural Disasters, UNDRO 1991.

- collect latest IDA and ADB documentation on planning of the afforestation to be implemented in parallel with sea-facing embankments under the Cyclone Protection Project (CPP-II).

- obtain latest mapping from SPARRSO of present coastal afforestation and transfer to project maps, delineate accreting and eroding coast-lines.

- obtain and record details of the procedures adopted by BWDB and CPP II for afforestation of coastal embankments in the Cox's Bazar District. Of main interest are Deposit Works procedures and local voluntary participation procedures.

c) Visiting Local Consultants

The inputs suggested in the House of Consultants (HoC) proposal have been reviewed in the light of the current situation and needs (as discussed in section 5.2.2 and Annex B). The focus and/or the time allocation for several of the posts have been modified, and different experts nominated accordingly. It is now proposed that 12 of the the 20 man-months of visiting local consultancy time allowed for in the HoC Contract be utilized as indicated in **Table 6.1.** Eight months remain to be allocated. (Table 6.1 also shows the originally-proposed allocations, for information.)

TABLE 6.1

Visiting Local Consultants from House of Consultants

Discipline/Post	Months	Name	TOR
(a) Current Proposals			
Public Sector Accounting	1.0	M.U.Afzal	Assist Rural Infra-structure Specialist in relation to cyclone rehabilitation
Telecommunications	2.0	Nasiruddin Ahmed	TOR in Table 6.2
Sociologist/Gender issues	2.5	Ishrat Shamim	TOR in Table 6.3
Agriculture	2.5	Amjad Hossain	TOR in Table 6.4
Training	3.0	To be named	Assist in assessing training needs and resources, and in organizing initial training events
Library	1.0	To be named	Establish cataloguing system for DCMU
Unallocated	8.0		

(b) Original Proposal

Disaster Management	1.0
Flood Control/Water Resources	2.0
Macro-Economics	1.0
Public Sector Accounting	1.0
Social Anthropology/Local Participation	1.0
Natural Resources	3.0
Hydrologist	1.0
Communications	1.0
GIS	1.0
Institutions/Training	1.0
Community Health	1.0
Nutrition	1.0
Sanitation	1.0
Water Pollution	1.0
Unallocated	3.0

TABLE 6.2

BGD/91/021 : Assistance to Ministry of Relief in Cyclone Rehabilitation
Terms of Reference for Telecommuncations Studies

The Telecommunication Consultant will carry out the following tasks:

i) make contact with all relevant on-going and proposed projects including:

- Bangladesh Red Crescent Society : Cyclone Preparedness Project.
- UNDP/World Bank : Multi Purpose Cyclone Project
- Japan/BMD : Micro Wave Link to Weather Radar Stations.
- EEC (Proposed) Cyclone Shelter/Primary School Project.

ii) inventory existing communications systems within Bangladesh and between Bangladesh and the outside world;

iii) by studying reports and by discussion evaluate the reliability and usefulness of each system at time of national emergency using the 1991 cyclone as an example;

iv) assess the communications requirements of the Ministry of Relief as the focal point in coordinating and monitoring disaster relief and rehabilitation;

v) review of legislation covering the use of telecommunication equipment;

vi) review the mode of communications between Indian data gathering stations and the appropriate Bangladesh organisations;

vii) based upon the findings of the above investigations prepare outline proposals to provide:

- reliable communications for effective disaster management at times of cyclones, floods and other emergencies, at the international, national, regional and local levels.

- appropriate communication for the Ministry of Relief.
- draft legislation covering the use of telecommunications at times of National Emergency.

viii) preparation of shopping list, with detailed specifications, for Ministry of Relief equipment to be procured under BGD/91/021 - budget $ 125 000.

ix) preparation of draft proposals for inclusion in Flood Action Plan Project 11 : Comprehensive Disaster Preparedness Programme, including Terms of Reference for any further sutides required, and associated technical assistance inputs.

TABLE 6.3
BGD/91/021 : Assistance to Ministry of Relief in Cyclone Rehabilitation
Terms of Reference for Social Studies

Collect and review the literature, consult with relevant individuals or groups (in Dhaka and elsewhere as feasible), and prepare a concise report on the key findings in relation to:(*)

i) the causes of deaths (e.g. drowning, injury, diarrhoeal or other diseases) among different social, gender, and age groups, during or as a direct consequence of cyclones (and floods) in Bangladesh, including any significant differences apparent between different geographical and administrative areas;

ii) the extent to which different groups were aware of and understood the warnings issued;

iii) the actions taken by different groups in response to the warnings, and their reasons (whether all, some or none of the household members moved to shelter sites);

iv) the significance of land tenure issues in the decisions of different groups;

v) the extent to which different groups were able to save livestock and property;

vi) the access of different groups to relief and assistance in rebuilding their lives and livelihoods;

vii) how different groups were able to recover;

viii) the survival strategies that operated within and between households and village communities among different social and gender groups, and the factors which enhance or diminish individual and community capacities;

ix) the specific needs of different social and gender groups for education or training, and the priority areas to be addressed: e.g. the meaning of particular warnings; actions which can be taken to minimize losses; how to reduce health risks (including water supply and sanitation issues).

x) the specific needs of community leaders, government officers, and NGO personnel, for training in disaster related issues, in particular related to social and gender aspects.

xi) an assessment of the gaps, if any, in current knowledge, the potential importance of the aspects concerned, and proposals for addressing them.

Contribute to the formulation of relevant objectives and activities for the follow-up comprehensive disaster preparedness project (FAP-11).

Prepare a bibliography on social and gender issues in relation to cyclones, floods and other disasters in Bangladesh.

(*) Readily available data in Dhaka and at District level should be collected. It is not envisaged that trips to all affected Upazilas should be made.

TABLE 6.4

BGD/91/021 : Assistance to Ministry of Relief in Cyclone Rehabilitation
Terms of Reference for Agricultural Studies

The consultants will:

(i) Obtain copies of all Standing Orders Codes etc. that have been issued to or developed by the Ministry of Agriculture in connection with disaster management etc.

(ii) Collect and review available technical reports and evaluations concerning cyclone, flood and drought damage to crops during recent years, and agricultural rehabilitation programmes, with special reference to the floods and cyclones of 1988 and 1991, and the Land Resources Appraisal of Bangladesh for Agricultural Development series of reports (FAO/UNDP 1988);

(iii) Meet with relevant agricultural officers at national level (in DAE, BARC, BARI and BADC), and make field trips to meet and hold discussions with civil administration and agricultural officers at divisional, district, and upazila levels, and with Block Supervisors and farmers at union and village levels;

(iv) Meet with relevant personnel of selected NGOs (BRAC, CARE, CARITAS, RDRS,....), FAO, and other technical advisory groups (e.g. USAID, World Bank, EEC, WFP....);

(v) Review a sample of the damage reports submitted through the civil administration and agricultural directorate channels following the 1991 cyclone and the 1988 floods and the extent to which recommendations in these reports were implemented;

(vi) Evaluate the overall coordination of relief and rehabilitation efforts by various agencies and NGOs and assess the degree of duplication (if any);

(vii) Prepare standard damage assessment proformas for the use of district and upazila staff and for missions;

(viii) Prepare a concise summary report on the key findings in relation to:

- the status of the codes and standing orders and any other official guidelines that may be found, and the extent to which they are available and used (in field operations or training);
- the nature of the contingency plans for agricultural rehabilitation prepared at national and local levels (the extent to which the guidelines provided in the 1980/81 code are followed, and the specific reasons for any departures);
- the training received by agricultural officers at all levels specifically relating to disasters (prevention, precautions, damage assessment, and rehabilitation);
- the extent to which block supervisors and other personnel are informed about and pass on warnings of floods or cyclones (in theory and in practice);
- the apparent accuracy of initial crop damage reports from the various sources, the consistency of the reports submitted through the different reporting channels, and the relevance of those reports as indications of the need for relief and/or rehabilitation assistance;
- the extent of losses of crops, draught animals, and other essential agricultural inputs in different areas;
- the extent to which crop losses were able to be recuperated by replanting or the planting of substitute crops, and the factors which determined the scope and rapidity recovery for different groups of farmers;
- the criteria applied to the distribution of (i) relief to farmers and landless agricultural labourers, and (ii) inputs for agricultural rehabilitation;
- the extent to which different groups had access to credit to finance the acquisition of inputs;
- the likely effects on post-disaster agricultural rehabilitation operations of the changed role of BADC.

(ix) Prepare recommendations in relation to:

- the most relevant, feasible indicators of the short- and medium-term effects on agriculture and the various population groups who depend on agriculture for their livelihoods (including the possibilities for agricultural rehabilitation/recovery);
- when, how, and by whom, valid estimates of the above can be made;
- the up-dating and refinement of guidelines and procedures for initiating precautionary measures and assessing agriculture-related damage and needs following a cyclone or flood;
- the training requirements of agricultural personnel at all levels in relation to preventive measures, assessment and rehabilitation;
- the possible involvement of the UAOs and block supervisors in the dissemination of flood warnings;

(x) Collaborate with the specialist engaged to prepare hazard maps of Bangladesh, particularly in relation to droughts leading to crop shortfalls.

CHAPTER 7

ISSUES ARISING FOR CLARIFICATION

7.1 Introduction

Various issues have been raised in the first six Chapters of this Inception Report, which need to be considered, discussed and clarified to enable the Project to procede along lines acceptable to all concerned. These issues are summarised in this Chapter.

7.2 Terms of Reference

Agreement is urgently needed on the interpretation/refinement of the Terms of Reference put forward in Chapter 5 and **Annex B.**

The refinements relate to:

i) detailed modifications under **Immediate Objectives 1 and 2** to reflect delays in Project start up;

ii) consideration of the need for an Office of Disaster Management under **Immediate Objective 2;**

iii) the designation of FAP:11 as a Comprehensive Disaster Preparedness/Management Project to enable a more all embracing project to be considered.

7.3 National Disaster Prevention Council (NDPC)

The NDPC has a defined role in the Prodoc but it is understood that it now no longer functions effectively.

7.4 Counterpart Staff

Action is required to firm up the counterpart staffing arrangements.

7.5 Revised Workplan and Related Staffing

Discussion, modification, if necessary, and approval of the Revised Workplan and related staffing schedule.

7.6 Role of DCMU in an Emergency

Some consideration has been given to the role of the embryonic DCMU in the event of a real emergency. The view of the Contractor is that until such time as the Unit has been fully staffed by full time GOB officers for a period of at least six months and has all the necessary communications equipment, it should not be looked upon as an operational unit.

REFERENCES

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Bangladesh Bureau of Statistics (BBS)	1990	Statistical Year Book of 1990.
Bangladesh Bureau of Statistics (BBS)	1991	Statistical Pocketbook of Bangladesh, 1991
Bangladesh Red Crescent Society (BRCS)	1973	Cyclone Preparedness Project
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Bangladesh Red Crescent Society (BRCS)	1986	Disaster Preparedness Programme
Bangladesh Rural Advancement Committee (BRAC)	1991	Cyclone Relief Programme 1991, The BRAC Response.
Bangladesh University of Engineering and Technology (BUET) et al	1992	Multipurpose Cyclone Shelter Project, Inception Report for GOB/UNDP/World Bank Project BGD/91/025.
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Community Development Library (CDL)	1992a	Living with Cyclone.
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GOB/UNDP	1991	Report of the Brainstorming Session on Disaster Preparedness and Management, Dhaka, 1-10 January 1991.

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Kafiluddin, A.K.M.	1991	Disaster Preparedness for Bangladesh Floods and Other Natural Calamities, Padma Printers, Dhaka.
Khan Chowdhury, M.H.	1992	A Brief on the Movement of the Killer Cyclone of 29/30 April 1991 and the activities of different Government machineries towards preparedness programmes to face the Cyclone (unpublished manuscript, May 1992).
Local Government Engineering Bureau (LGEB)	1990	Upazila Plan Book (1990/91 - 1994/95).
Ministry of Agriculture and Forests (MAF)	1980 (English)	Flood and Cyclone Code.
-"-	1981 (Bengali)	-"-
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Relief and Rehabilitation Division, Ministry of Food (RRD)	1984	Emergency Standing Orders for Floods.

Simpson, R.H. and Riehl, H.	1981	The Hurricane and its Impact.
United Nations Centre for Regional Development (UNCRD)	1991	Cyclone Damage in Bangladesh.
UNDP/UNDRO	1991	Disaster Management Manual (Draft).
World Meteorological Organisation (WMO)	1990	International Meteorological Vocabulary (WMO Publications No. 182) Draft Second Edition.
Zonal Relief Coordinator, Chittagong (ZRC)	1991	Operation Sheba : Relief and Rehabilitation Plan, Zila Parishad Office, Chittagong, 5 June 1991.

ANNEXES

ANNEX A

CONTRACT TERMS OF REFERENCE

TERMS OF REFERENCE

International consultancy services for BGD/91/021:
"Assistance to Ministry of Relief in Coordination of Rehabilitation".

I. PROJECT'S BACKGROUND AND OUTLINES

Bangladesh has been stricken by number of natural disasters in recent years. On 30 April 1991, a devastating cyclone and tidal wave lashed the southern coastline of this country. The death toll is estimated at approximately 150,000 people. Over 850,000 acres of harvest-ready cropland was damaged, 790,000 homes were destroyed and 11 million people were affected. Damage to infrastructure includes 9,033 schools and about 500 km of roads and 496 bridges.

Each time a disaster strikes, relief and rehabilitation efforts drain large amounts of internal and external resources which would have otherwise been available for development purposes. While Bangladesh has established institutions and procedures for managing natural disasters and post-disaster recovery, these are in need of updating and strengthening to take into account institutional and infrastructural changes that have taken place in recent years. Also, external aid given to Bangladesh for disaster relief operations needs to be coordinated in a more streamlined manner.

The project was designed to address three interrelated tasks currently on the agenda of the Bangladesh Government which are the following:

a) To increase managerial and administrative capacity of the Ministry of Relief (MOR) as the focal point in monitoring and coordinating disaster relief and rehabilitation by establishing a Disaster Coordination and Monitoring Unit (DCMU) with the capacity to collect, consolidate and analyze data on disaster related activities;

b) To review the operation of existing Government and non-government emergency procedures, standing orders, forecasting and warning systems and assess improvement needs, to prepare, on this basis, proposals on a future disaster preparedness strategy for the government and other organizations involved in disaster preparedness activities;

c) In the light of existing requirements for professional training to design and implement in-country training programme in disaster preparedness and management;

d) To prepare feasibility studies on disaster-related projects with emphasis on establishing priorities for investment in repair and rehabilitation, particularly in coastal protection and infrastructure. This will result in the preparation of the Cyclone Action Plan.

II. STARTING DATE

15 December 1991.

III. SCOPE OF SERVICES

1. Under the contract with the Office for Project Services of the United Nations Development Programme a consulting firm will require to provide for a total duration of 21 working months a group of highly qualified and experienced specialists whose job descriptions and required qualifications are given in Appendix I.

2. The consulting firm will prepare detailed TOR for local consultancy services and upon endorsement by OPS, subcontract or enter into a joint venture with a local company from among those given in Appendix II for the service of national professionals to assist in the activities described below. Draft job description of the personnel to be recruited are given in Appendix II.

3. Additional short-term international consultants may be required to assist the full-time team and concerned agencies to carry out the project activities for a total of 5 months. In consultation with the Government counterpart the Team Leader will propose on discipline and subject of the required specialists.

4. The project objectives and outputs expected to be produced as a result of the contract are as follows:

Immediate Objective 1

To strengthen the Ministry of Relief's capability in monitoring and coordination in ensuring that short term repair activities are carried out to the maximum extent in the most effective and consistent manner and to assist MOR in carrying out its role as the focal point for the co-ordination of short-term repair and rehabilitation activities resulting from the April 1991 cyclone.

Output 1.1

An effective organization in MOR with the capability for managing the monitoring, coordination and disaster preparedness programmes and with the requisite hardware, software, trained personnel and management systems.

Activities for Output 1.1

1.1.1 Establishing a unit in MOR which will be the precursor to the Disaster Coordination Office to be established under Flood Action Plan (FAP) Disaster Preparedness project. The unit to be called the *Disaster Coordination and Monitoring Unit (DCMU)*.

1.1.2 Setting-up a Management Information System with appropriate hardware and software and training MOR staff in its use and application.

1.1.3 Establishing an effective system for gathering, consolidating and analyzing information on disasters and disaster related activities.

1.1.4 Establishing unified data format and reporting systems.

1.1.5 Training in all the above.

Output 1.2

Effective coordination, monitoring and planning of disaster related activities.

Activities for Output 1.2

1.2.1 Collecting and analyzing data on pre, during and post disaster situations and activities.

1.2.2 Preparing timely and accurate reports for government to assist in its decision making and for dissemination to the concerned agencies and to the media as may be appropriate.

1.2.3 Identifying and mobilizing further relief or short-term investment requirements.

1.2.4 General planning of disaster related activities where a coordinated and consistent approach is indicated.

1.2.5 Assessing the long term requirements of an integrated coastal protection system and make recommendations for planning and implementation.

1.2.6. Training in all the above.

Output 1.3

Effectively prepared disaster related projects and programmes.

Activities for Output 1.3

1.3.1 Identifying gaps in damage assessments and proposing assistance to carry out surveys and to identify rehabilitation projects and programmes.

1.3.2 Providing inputs, where required, to assist in the formulation and preparation of documents for investment projects.

Output 1.4

Effective coordination of short-term repair and rehabilitation efforts, accurate and concise reports and assistance in the cyclone damage assessment.

Activities for output 1.4

1.4.1 Assist in the coordination of implementing agencies' relief, short-term repair and rehabilitation efforts in the aftermath of April 1991 cyclone.

1.4.2 Assist MOR in the preparation of reports on progress and impacts of these efforts.

1.4.3 Provide advice and when necessary propose assistance to the concerned agencies in setting-up surveys, undertaking damage assessments and formulating remedial works or activities.

Immediate Objective 2

To review operation of existing Government and non-government procedures for disaster management with a view to integrating, reinforcing or expanding these procedures, assess the training needs in disaster management and initiate training programmes.

Output 2.1

Evaluation on status of existing procedures for disaster management giving recommendations for up-dating and strengthening and for setting-up an office on disaster management.

Activities for output 2.1

2.1.1 Review and assess status of existing standing orders, codes, emergency procedures, forecasting and warning systems etc for disaster management for cyclone, floods and earthquakes in the various concerned agencies.

2.1.2 In light of the above review of existing procedures, make recommendations on the modifications or revisions required to update them.

2.1.3 Assess the training needs and identify suitable institutions for providing training in disaster management.

2.1.4 Design and initiate implementation of an in-country training programme in disaster preparedness and management which will be the precursor of the main training programmes to be undertaken under FAP Disaster Preparedness Programme.

Immediate Objective 3

In conjunction with the Flood Action Plan, to prepare a comprehensive project document and other related documents for Flood Disaster Preparedness.

Output 3.1

A project document and draft terms of reference for FAP Disaster Preparedness.

Activities for Output 3.1

3.1.1 In the light of the findings of the Evaluation report (output 2.1) establish the technical assistance requirements for setting-up an office of Disaster Management, implementing proposed revisions to procedures and design schedule of recruitment and placement of Government and non-government staff.

3.1.2 Establish the functions of the proposed office of Disaster Management and an appropriate staffing pattern.

3.1.3 In consultation with MOR, the local UNDP office and the Flood Plan Coordination Organization (FPCO) prepare a Project Document for FAP Disaster Preparedness.

3.1.4 In consultation with FPCO, assist in the preparation of a Technical Assistance Plan and a Project Concept Paper.

Immediate Objective 4

In conjunction with the Flood Action Plan, to prepare a concept plan for integration measures to protect coastal areas from the effects of cyclones and tidal surges into the overall disaster preparedness system and into the Flood Action Plan.

Output 4.1

A concept plan which would outline an integrated approach to coastal protection and indicate how long term measures can be implemented in a coordinated and consistent manner, taking due account of the need to emphasize priority investments.

Activities for Output 4.1

4.1.1 In consultation with the current implementation agencies, establish the concept for an integrated approach to coastal protection which would cover normal tidal as well as cyclone events.

4.1.2 Prepare a structure for the programme which would group the various elements by function, phase and sector and establish the linkages.

4.1.3 Identify priorities and suggest the multi-sectoral responsibilities for implementation.

4.1.4 Review ongoing relevant Flood Action Plan activities and determine the modifications, extensions or additions that may be required.

5. Progress report should be prepared and submitted to OPS/UNDP every three month of services. Terminal report outlining activities performed, conclusions and recommendations within two weeks upon completion of the mission in four copies to be submitted to the following address:

Att: Mr. Daan Everts
Assistant Administrator and Director
Office for Project Services
220 East, 42 Street, Room - 1547
New-York, N.Y. 10017. Ref: BGD/91/021

6. Preliminary workplan is attached. The workplan is to be up-dated and adjusted by the company upon arrival in Bangladesh. Agreed upon by all parties concerned, a copy of the workplan is to be submitted to OPS/UNDP.

IV. LOCATION

Dhaka, Bangladesh, with intensive travel to provinces, disaster-pron zones.

VI. LANGUAGES

English

Appendix I

International Consultants Team

Title: Team Leader

Duration: 10 months

Duties:

With consultations with OPS and the UNDP office in Dhaka the incumbent will organize, administer, coordinate and monitor the work of the team of the consultants. He/she will have the overall responsibility for the production of the outputs and the achievement of objectives of the project. In particular the team leader will:

- ensure implementation of the related components of the project workplan;

- advise on, and participate in establishing DCMU in MOR, in training programmes for national counterparts and preparation of the feasibility study, project document and other related documents in accordance with the Flood Action Plan;

- supervise the work of the team of international consultants and ensure that their work contributes to the production of the project outputs as planned;

- Finalize preparation of TOR for services of local contractors/individual consultants and conclude service contracts upon endorsement by OPS;

- Supervise and guide the work of a co-team leader who will be in charge for coordination of the national consultants;

- maintain communication and coordination with the Ministry of Relief, UNDP and with the participating agencies;

- produce of the progress/terminal reports as/when required.

The team leader will have at least five years experience in the field of the institutional and rural infrastructural development with emphasizes on disaster nsk preparedness and mitigation, preferably in the South Asia region.

Title: Information Systems Management Specialist

Duration: 6 months

Duties:

Under the overall guidelines by the Team Leader the incumbent will contribute to the project implementation by assisting to establish reliable communication network hereby improving the efficiency of the existing system of transmitting, storing and

analysis data related to disaster preparedness and disaster risk mitigation. In particular the incumbent will:

- design and set-up a Management Information System in a newly establishing DCMU/MOR with appropriate hardware and software equipment;

- work out a list of equipment to be supplied from different sources and arrange installation;

- train MOR staff in utilizing computer and other communication equipment facilities;

- establish an effective system for gathering, consolidating and analyzing information on disasters and related activities;

- introduce and establish unified data format and reporting system;

- advise on the production of reports, manuals, documents and other publications issued by DCMU.

- prepare a final report upon completion of the assignment.

The information system management specialist will have at least five years experience covering the development of management information systems, media applications and training. Prior experience in the South Asia region would be an advantage.

Title: Disaster management specialist

Duration: 3 month

Duties:

Under the overall guidelines by the Team Leader the incumbent will be responsible for designing and advising on the plan aimed at strengthening the national disaster preparedness and management system with particular reference to the April 1991 cyclone and the lessons to be learnt from the preparedness, relief and rehabilitation activities. In particular, the incumbent will:

- review and assess status of existing standing orders, codes, emergency procedures, forecasting and warning systems etc for disaster management for cyclones, flood and earthquakes in the various concerned agencies, and make recommendations on the
modifications or revisions required to update them;

- advise on functions of DCMU and of the office of Disaster Management and an appropriate staffing pattern;

- assess the training needs and identify suitable institutions for providing training in disaster management;

- advise to the agencies concerned on setting-up surveys, undertaking damage assessments and formulating remedial works or activities;

- contribute to the strengthening the national disaster management system by participating in preparation of the Flood Action Plan and a project document and draft terms of reference for the technical assistance.

The disaster management specialist will have at least five years experience in disaster management and disaster risk preparedness and mitigation activities. Experience in the Asia-Pacific region would an advantage.

Title: Coastal and River Engineering Specialist

Duration: 2 months

Duties:

The incumbent, in conjunction with his colleagues on the Professional Panel, will advise and supervise the full-time team and the part-time consultants. He/she will have the responsibility for the effective implementation of the relative components of the workplan and in particular:

- assessing the need for strengthening of river coasts and advising on resettlements as appropriate;

- contributing to the preparation of the reports and documents stipulated by the project.

Three-four missions to be undertaken by this specialist to Bangladesh during the course of the project.

The specialist will be a high level professional with at least 10 years broad-based experience in the field of coastal protection, flood control and general water resource development and planning - including disaster related aspects, institutional development and training. Previous experience in the South Asia region is essential, preferably in Bangladesh.

Appendix II

List of Preselected Local Consulting Firms:

1. Development Design Consultants LTD.
2. House of Consultants Limited.
3. Engineering and Planning Consultants Limited (EPC).
4. Desh Upodesh Limited in association with Resources Planning and Management Consultants.
5. Development Planners and Consultants in association with Sheltech and CDRB.

Draft TOR for Local Consultancy Services

Title: Co-Team Leader

Duration: 9 Months

Duties:

The incumbent will assist the Team Leader in the management of the project and in the production of the outputs and the achievements of the objectives of the project. In particular the Co-Team Leader will:

Contribute to the establishment of DCMU and to the proper training of local officials;

Assist in data collection and processing, reporting, planning, identifying investment opportunities for repair and rehabilitation activities;

Supervise the work of the team of local consultants and ensure that their work contributes to the production of the project outputs as planned;

arrange production of the progress/terminal reports as/when required.

He/She will also have a special responsibility for establishing effective coordination systems and will ensure that the desired linkages are set-up with concerned agencies.

The Co-Team Leader will have at least five years experience of institution building, social programmes and be familiar with the workings of Government, particularly on disaster risk preparedness and related activities.

Title: Disaster Preparedness Specialist

Duration 9 Months

Duties:

Under the overall guidelines by the Co-Team Leader the incumbent will contribute to the project implementation, will be responsible for the outputs involving disaster preparedness and management aspects, in data collection and processing, reporting and planning.

He/She will be concerned with the monitoring and coordinating activities and particularly establishing an effective system for gathering, consolidating and analyzing information on disaster related activities.

An evaluation report will be prepared on the status of existing procedures for disaster management giving recommendations for up-dating and strengthening and for setting-up an office of Disaster Management.

He/She will review and assess status of existing standing orders, codes, emergency procedures, forecasting and warning systems etc, for disaster management for cyclones, floods and earthquakes in he various concerned agencies.

He/She will design and initiate implementation of an in-country training programme in disaster preparedness and management which will be the precursor of the main training programmes to be undertaken under Disaster Preparedness programme.

The disaster preparedness specialist will have at least 5 years experience in disaster management and related activities.

Title: Rural Infrastructure Specialist

Duration: 9 Months

Duties:

The incumbent will be responsible for advising on measures to be taken to improve storm/cyclone resistance structure of the rural area. In particular the rural infrastructure Specialist will contribute to achieving outputs as described in paragraph 1.1.3, 1.2.1, 1.2.5, 1.4.3, 2.1.4 of TOR above.
The Specialist will have at least five years relevant experience in rural area structuring.

Title: Natural Resources and Environmental Specialist

Duration: 9 Months

Duties:

The Natural Resources and Environmental Specialist will be responsible for the monitoring and coordination aspects involving natural resources and the environment.

He/She will have a special role in identifying and coordinating rehabilitation activities involving agriculture, fisheries, forestry and livestock and in ensuring that, where appropriate, environmental impact analyses are carried out.

The natural resources and environmental specialist will have at least five years relevant experience in natural resources and the environment.

Title: Professional Panel Specialists

Duration: 24 Months

Duties:

The six specialists:

- Water resources specialist;
- Natural resources specialist
- Social institutions specialist
- Communication specialist
- Economist
- Hydraulic engineering specialist

Will be recruited for 4 man-month each to contribute in implementation the project activities at the desired professional standards. They will provide inputs at key stages, probably about three or four times during the course of the project and at other times when necessary.

Each specialist will be a high level professional with at least 10 years broad-based experience in their respective disciplines (water resources, natural resources, social institutions, rural infrastructure, economics and hydraulic engineering) including disaster related aspects and government and non-government institutions.

The project will require inputs of visiting consultants as and when necessary of total 30 man-months. They will be subject matter specialists (disaster management, flood control, environment, socio-economics, hydrology, meteorology, mass communications, etc) and will assist the full-time team and concerned agencies to carry out the project activities.

The various disciplines will become known as the project proceeds.

ANNEX B

ANALYSIS OF PROJECT OBJECTIVES, OUTPUTS AND ACTIVITIES

ANNEX B

ANALYSIS OF PROJECT OBJECTIVES, OUTPUTS, AND ACTIVITIES

As defined in the project TOR

TOR as stated in Prodoc and Consultancy Contract	*Remarks*
IMMEDIATE OBJECTIVE 1	
To strengthen the Ministry of Relief's capability in monitoring and co-ordination in ensuring that short term repair activities are carried out to the maximum extent in the most effective and consistent manner and to assist MOR in carrying out its role as the focal point for the co-ordination of short-term repair and rehabilitation activities resulting from the April 1991 cyclone.	The stated objective relates specifically to short-term repair and rehabilitation activities with particular reference to those resulting from the 1991 cyclone. However: (i) several of the outputs and activities listed are much broader in scope, referring to disasters and disaster-related activities in general; (ii) project activities have started 12 months after the cyclone rather than early in the rehabilitation phase (as originally intended). Some re-emphasis and clarification of this objective, its outputs and activities is needed. It is suggested that Objective 1 be interpreted (restated) in the following terms: *To strengthen the Government's capability to co-ordinate and monitor disaster-related activities, through the Ministry of Relief.*
Output 1.1 An effective organisation in MOR with the capability for managing the monitoring, co-ordination and disaster preparedness programmes and with the requisite hardware, software, trained personnel and management systems.	**Output 1.1** refers specifically to disaster "preparedness" programmes. The specified activities relate to: establishing a DCMU (within the MOR); relevant management information systems; information "on disasters and disaster-related activities"; reporting formats and systems; related training. There is no reference to repair/rehabilitation activities arising from the 1991 cyclone. The precise functions of the DCMU are nowhere defined.
Activities for Output 1.1 1.1.1 Establishing a unit in MOR which will be the precursor to the Disaster Co-ordination Office to be established under Flood Action Plan (FAP) Disaster Preparedness project. The unit to be called the Disaster Co-ordination and Monitoring Unit (DCMU).	The DCMU is intended to be a precursor to a "Disaster Co-ordination Office" (to be established under FAP.11). Objective 3 refers to planning for the establishment of an "office of Disaster Management", while the present draft prodoc for FAP.11 refers variously to an "Office of Emergency Preparedness" and an "Office of Disaster Management". The eventual functions of the Office(s) to be established under FAP.11 -- and hence its title -- remain to be determined as part of Objective 3. The
1.1.2 Setting-up a Management Information System with appropriate hardware and software and training MOR staff in its use and application.	
1.1.3 Establishing an effective system for gathering, consolidating and analysing information on disasters and disaster related activities.	

TOR as stated in Prodoc and Consultancy Contract	*Remarks*

1.1.4 Establishing unified data format and reporting systems.

1.1.5 Training in all the above.

information and reporting systems will be further developed under the follow-on project (FAP.11).

The DCMU was to be staffed by full-time personnel from MOR who would remain in their posts after completion of the present project. In practice, DCMU is being staffed by a very limited number of personnel seconded from MOR and elsewhere, the majority being only part-time.

Output 1.2

Effective co-ordination, monitoring and planning of disaster related activities.

Output 1.2 introduces the "planning" of disaster-related activities, in addition to co-ordination and monitoring. A wide range of activities are specified covering: data on "pre-, during, and post-disaster situations"; reports to assist in decision-making"; "further relief and short-term investment requirements"; "planning of disaster-related activities"; recommendations for an "integrated coastal protection system"; related training.

It is not clear to what extent this output and its activities were/are intended to relate specifically to the aftermath of the 1991 cyclone and/or to disaster-related activities in general. If the former, which appears to be more likely, then the relevance of the first four activities is reduced by the delay in the commencement of the project, If the latter, then the most that can reasonably be expected is the design and demonstration, on a preliminary basis, of the possibilities and systems for performing the functions represented by those activities. These would then be further developed under the follow-up project.

Activities for Output 1.2

1.2.1 Collecting and analyzing data on pre, during and post disaster situations and activities.

1.2.2 Preparing timely and accurate reports for government to assist in its decision making and for dissemination to the concerned agencies and to the media as may be appropriate.

1.2.3 Identifying and mobilizing further relief or short-term investment requirements.

1.2.4 General planning of disaster related activities where a co-ordinated and consistent approach is indicated.

1.2.5 Assessing the long term requirements of an integrated coastal protection system and make recommendations for planning and implementation.

1.2.6 Training in all the above.

In view of the above, it is suggested that **Outputs 1.1 and 1.2** and the corresponding activities be consolidated, being interpreted (restated) in the following terms:

Output 1.1 — *An effective unit, under the MOR, with initial management information and related systems to support the promotion, co-ordination and monitoring of disaster-related activities with special reference to preparedness, relief, and short-term rehabilitation and repairs.*

TOR as stated in Prodoc and Consultancy Contract	*Remarks*
	Activity 1.1.1 *Establishing a "Disaster Co-ordination and Monitoring Unit" under the MOR, as a precursor to a more broadly-based Office/Unit to be developed under a follow-up project -- Comprehensive Disaster Preparedness/ Management (FAP.11).* *Activity 1.1.2* *Designing a Management Information System, and developing and installing initial applications (with appropriate hardware and software) with priority to those relevant to the consolidation, analysis and reporting of data for preparedness, relief and rehabilitation activities.* *Activity 1.1.3* *Developing systems for gathering, consolidating and analysing information on disasters and disaster-related activities.* *Activity 1.1.4* *Developing data collection formats and reporting systems.* *Activity 1.1.5* *Providing training to government staff of the DCMU in the use of the above systems (both computer- and paper-based).* The original activity 1.2.3 is eliminated (being no longer relevant). Activities 1.2.1, 1.2.2, 1.2.4, and 1.2.6 are subsumed into the above in the context of future disaster management requirements. Assessment and reporting in relation to post-1991 cyclone rehabilitation is subsumed under the original output 1.4. Activity 1.2.5 is subsumed under Objective 4.
Output 1.3 Effectively prepared disaster related projects and programmes. **Activities for Output 1.3** 1.3.1 Identifying gaps in damage assessments and proposing assistance to carry out surveys and to identify rehabilitation projects and programmes.	The original **Output 1.3** and its specified activities, although stated in general terms, are assumed to refer specifically to post-cyclone rehabilitation. As such, they need to be adjusted to what is appropriate at the present time, nine months later than originally intended. It is suggested that this output and its activities be interpreted (restated), and renumbered, as follows: *Output 1.2* *Improved arrangements for damage assessments and the preparation of repair and rehabilitation projects and programmes.*

TOR as stated in Prodoc and Consultancy Contract	*Remarks*
1.3.2 Providing inputs, where required, to assist in the formulation and preparation of documents for investment projects.	*Activity 1.2.1* *Identifying deficiencies in damage assessments following the 1991 cyclone, and making proposals for more effective assessments in the future.* *Activity 1.2.2* *Provide advice and, when necessary, propose assistance to concerned agencies in organising surveys, undertaking damage assessments, and formulating remedial works or activities.*
Output 1.4 Effective co-ordination of short-term repair and rehabilitation efforts, accurate and concise reports and assistance in the cyclone damage assessment.	The original **Output 1.4** and its related activities refer specifically to the aftermath of the 1991 cyclone. The reference to co-ordination of "relief" efforts clearly indicates that the activities were envisaged to be carried out very shortly after the cyclone event. It is suggested that these should now be consolidated, and renumbered, as follows:
Activities for output 1.4	*Output 1.3* *Assessment of the repair and rehabilitation efforts following the 1991 cyclone.* *Activity 1.3.1* *Assist MOR in the preparation of reports on the progress of repair and rehabilitation efforts following the 1991 cyclone.*
1.4.1 Assist in the co-ordination of implementing agencies' relief, short-term repair and rehabilitation efforts in the aftermath of April 1991 cyclone. 1.4.2 Assist MOR in the preparation of reports on progress and impacts of these efforts. 1.4.3 Provide advice and when necessary propose assistance to the concerned agencies in setting-up surveys, undertaking damage assessments and formulating remedial works or activities.	The other, originally listed activities (1.4.1 and 1.4.3) would be eliminated, subsumed in part into the new 1.2 above.

TOR as stated in Prodoc and Consultancy Contract	*Remarks*
IMMEDIATE OBJECTIVE 2	
To review operation of existing Government and non-government procedures for disaster management with a view to integrating, einforcing or expanding these procedures, assess the training needs in disaster management and initiate training programmes.	This objective and its related activities concern the review (and eventual improvement) of *procedures* for "disaster management", and the initiation of in-country *training* in "disaster preparedness and management". They concern disaster management in general (not specifically related to the 1991 cyclone) and are explicitly seen as a precursor to the activities of the follow-up, longer-term project (FAP.11). The objective does not refer to *organisational structures* for disaster management, although output 2.1 specifically calls for recommendations for setting up an Office of Disaster Management. To clearly spell out the importance of reviewing overall co-ordination arrangements, and preparing recommendations for future structures, it is suggested that immediate objective 2 be expanded as follows: *To review existing procedures and organisational structures for disaster management with a view to their integration, reinforcement or expansion, as required, including the need for and functions of an Office of Disaster Management; and to assess training needs and initiate preliminary training activities.*
Output 2.1 Evaluation on status of existing procedures for disaster management giving recommendations for updating and strengthening and for setting-up an office on disaster management.	**Output 2.1**, as stated, concerns not only procedures, but also organisational structures. The activities specified include training. It is suggested that these separate, but inter-related, elements be more clearly highlighted in terms of separate outputs, as follows: *Output 2.1* — *Evaluation of existing procedures (government and non-government) relating to disasters, and recommendations for up-dating and strengthening.*
Activities for output 2.1 2.1.1 Review and assess status of existing standing orders, codes, emergency procedures, forecasting and warning systems etc. for disaster management for cyclone, floods and earthquakes in the various concerned agencies.	*Activity 2.1.1* — *... as in TOR, but with the inclusion of droughts (thus: "cyclones, floods, droughts and earthquakes")* *Activity 2.1.2* — *... as in TOR.*
	Output 2.2 — *Assessment of existing and proposed organisational structures, and an outline for the duties, staffing, and rules*

TOR as stated in Prodoc and Consultancy Contract	Remarks
2.1.2 In light of the above review of existing procedures, make recommendations on the modifications or revisions required to update them.	*of business of a future Office of Disaster Management, or similar body, if required.*
	Activity 2.2.1 *Review the existing organisational structures and arrangements for disaster management, and identify deficiencies, if any.*
2.1.3 Assess the training needs and identify suitable institutions for providing training in disaster management.	*Activity 2.2.2* *In the light of the above, make proposals for the establishment and functioning of an office of disaster management or other appropriate organisational structures.*
2.1.4 Design and initiate implementation of an in-country training programme in disaster preparedness and management which will be the precursor of the main training programmes to be undertaken under FAP Disaster Preparedness Programme.	*Output 2.3* *An assessment of disaster management training needs and existing training resources; initiation of relevant training activities; and a disaster management training strategy for future development.*
	Activity 2.3.1 *Assess the training needs of government officials and others, and the needs for wider public education.*
	Activity 2.3.2 *Identify suitable institutions and training materials which may be involved in organising the required training.*
	Activity 2.3.3 *Develop an overall, long-term training strategy, design and initiate preliminary training activities as a precursor to the main training programme to be established under the follow-up project (FAP.11).*

TOR as stated in Prodoc and Consultancy Contract	*Remarks*

IMMEDIATE OBJECTIVE 3

In conjunction with the Flood Action Plan, to prepare a comprehensive project document and other related documents for Flood Disaster Preparedness.

As stated, the follow-up project is described as "Flood Disaster Preparedness". The present title of FAP.11 is, in fact: "Comprehensive Disaster Preparedness". The precise scope, and title, of the project should be decided in the light of the findings of the preceding activities and outputs.

It is therefore suggested that **Objective 3** be interpreted (restated) as follows:

> *To prepare a project document and other related documents for a Comprehensive Disaster Preparedness/Management programme within the context of the Flood Action Plan.*

Output 3.1

A project document and draft terms of reference for FAP Disaster Preparedness.

Output 3.1 and the specified activities should be interpreted (restated) as follows:

Output 3.1 — *A project document and draft terms of reference for a follow-on project for comprehensive disaster preparedness/management to be undertaken as FAP.11.*

Activities for Output 3.1

3.1.1 In the light of the findings of the Evaluation report (output 2.1) establish the technical assistance requirements for setting-up an office of Disaster Management, implementing proposed revisions to procedures and design schedule of recruitment and placement of Government and non-government staff.

Activity 3.1.1 — *In the light of the findings of 2.2 above, establish the technical assistance requirements for finalizing and implementing the proposed revisions to the existing disaster-related procedures, and for setting up an office of Disaster Management (or similar). Prepare a schedule of recruitment and placement of government and non-government staff.*

3.1.2 Establish the functions of the proposed office of Disaster Management and an appropriate staffing pattern.

3.1.3 In consultation with MOR, the local UNDP office and the Flood Plan Co-ordination Organisation (FPCO) prepare a Project Document for FAP Disaster Preparedness.

3.1.4 In consultation with FPCO, assist in the preparation of a Technical Assistance Plan and a Project Concept Paper.

Activity 3.1.2 — *In consultation with MOR, the local UNDP office, and FPCO, prepare a Prodoc for FAP.11: Comprehensive Disaster Preparedness/Management, a related Technical Assistance Plan, and Project Concept Paper.*

The original activity 3.1.2 is subsumed in the new/proposed activity 2.2.2. The original activities 3.1.3 and 3.1.4 are combined in the new/proposed activity 3.1.2.

TOR as stated in Prodoc and Consultancy Contract	*Remarks*
IMMEDIATE OBJECTIVE 4 In conjunction with the Flood Action Plan, to prepare a concept plan for integration measures to protect coastal areas from the effects of cyclones and tidal surges into the overall disaster preparedness system and into the Flood Action Plan. **Output 4.1** A concept plan which would outline an integrated approach to coastal protection and indicate how long term measures can be implemented in a co-ordinated and consistent manner, taking due account of the need to emphasize priority investments. **Activities for Output 4.1** 4.1.1 In consultation with the current implementation agencies, establish the concept for an integrated approach to coastal protection which would cover normal tidal as well as cyclone events. 4.1.2 Prepare a structure for the programme which would group the various elements by function, phase and sector and establish the linkages. 4.1.3 Identify priorities and suggest the multi-sectoral responsibilities for implementation. 4.1.4 Review ongoing relevant Flood Action Plan activities and determine the modifications, extensions or additions that may be required.	Objective 4, its output and related activities remain as stated, although under activity 4.1.4 consideration will be given not only to FAP projects but also to other relevant ongoing activities.

ANNEX C

LIST OF OFFICIAL BODIES WITH DISASTER MANAGEMENT RESPONSIBILITIES

ANNEX C

LIST OF OFFICIAL BODIES WITH DISASTER MANAGEMENT RESPONSIBILITIES

Directorate of Meteorology
Ministry of Relief
Directorate General of Relief and Rehabilitation
Cyclone Preparedness Programme
Ministry of Information Broadcasting
Radio Bangladesh
Bangladesh Television
Ministry of Health
Ministry of Food
Ministry of Agriculture and Forests
Ministry of Fishery and Livestock
Directorate of Livestock
Directorate of Fisheries
Ministry of Defence
Civil Aviation and Tourism
Bangladesh Army
Bangladesh Navy
Bangladesh Air Force
Ministry of Home Affairs
Bangladesh Rifles
Bangladesh Police
Directorate of Ansar and VDP
Fire Services and Civil Defence Directorate
Ministry of Communication
Railway Division
Roads and Roads Transport
Ministry of Shipping
Ministry of Works
Ministry of Social Welfare and Women Affairs
Ministry of Local Govt. Rural Development and Co-operatives
Local Government Division
Rural Development and Co-operatives Division
Ministry of Irrigation Water Development and Flood Control
Ministry of Foreign Affairs
Ministry of Finance
Finance Division
External Resources Division
Ministry of Industries
Ministry of Education
Ministry of Commerce
Ministry of Post and Tele-Communication
Ministry of Energy and Mineral Resources
Energy Division
Petroleum and Mineral Resources Division
Divisional Commissioners
Deputy Commissioners
Upazila Parishad
Union Parishad

Source : MORR, 1985

DDD

ANNEX D

PREVIOUS RECOMMENDATIONS

ANNEX D

PREVIOUS RECOMMENDATIONS

LIST OF CONTENTS

D.1 INTRODUCTION

D.1.1 Background

This Annex lists recommendations concerning all aspects of disaster management in Bangladesh that have been made by various Committees, Workshops in the last few years. It also includes some that have emerged during interviews with senior officials of GOB, UN agencies and NGOs visited by members of the project Team during the period by May-June 1992 (see **Annex J**).

In general, the recommendations extracted from previous reports and papers are quoted verbatim. They have not yet been "processed" (condensed). This will be done shortly.

D.1.2 Source Code

The source of each recommendation is identified by a code in the right hand column. These Source Codes are as follows:

Code	Source
1	Report of the Cyclone Disaster Preparedness Review Committee ordered by the President of Bangladesh. Chairman: Group Captain (Rtd) Syed Ahmed, July 1985.
2	NGO Response, ADAB, 1988
3	Improvement of Flood Forecasting and Warning: Public Awareness and Flood Preparedness Project, BGD/88/013, Kacic, WMO, 1992
4	Government Response to Natural Disaster in Bangladesh, Mr. Moniruzzaman, Paper submitted to Brainstorming Session, Dhaka, 1990
5	Lessons from 1991 Cyclone, Saidur Rahman, OXFAM, 1991
6	Cyclone Disaster 1991, NGO Co-ordination for the Rehabilitation programme, Saidur Rahman, OXFAM, June 1991.
7	Cyclone 1991 : An Environmental and Perceptional Study Bangladesh Centre for Advanced Study, 1991.
8	The Challenge Ahead, Saidur Rahman, OXFAM, 1991
9	Operation Sheba, Mokammel Haq, 1991
10	The 1991 Cyclone in Bangladesh, Impact, Recovery and Recommendation. Report prepared by Joint Task Force of the GOB and UN. High level special meeting on assistance to BD, Geneva, 1991
11	Disaster and Development. A Study in the Institution Building. A Report Commissioned by the Central Evaluation Office and the Planning and Co-ordination Office of UNDP, August 1991.
12	Through the 1990s and beyond, Hamida Hossain, F.H. Abed, Cole P. Dodge, 1992.
13	Disaster & Development - A study in Institution Building in Bangladesh, Atiur Rhaman, in From Crisis to Development, Hossain, Dodge, Abed, Eds., UPL, 1992.

14 Workshop on Hazard Assessment and Mitigation (with Focus on Floods). Organized by Science and Technology Division of Ministry of Education, GOB and sponsored by Commonwealth Science Council, London. January 27 to February 1, 1990.

15 Cyclone in Bangladesh by M.A. Choudhury Director (Research) SPARRSO, Bangladesh, 1990.

16 A Case Study on April 91 Cyclone in Bangladesh, ADPC/AIT Bangkok, August 1991.

99 Recommendations emerging from interviews (May, June 1992) of Senior Officials of GOB, UN Agencies and NGO's.

D.2 DISASTER MANAGEMENT (GENERAL)

D.2.1 Institutional arrangements

A disaster management centre should be set up under the direct control of the highest authorities the country which should be responsible for co-ordinating disaster response, warning system, and public education at all times.	11
The institutionalisation of disaster preparedness should receive higher priority. A suitable location of the proposed office needs to be agreed between government and donors, probably away from the Ministry of Relief, so as to allow it on the one hand to have a higher status and thus influence over the line ministries, and on the other hand to achieve linkages with NGOs and society as a whole.	11
National level consciousness and preparedness have to be created for facing disasters of similar nature. Ministry of Relief and Rehabilitation has to be strengthened.	9
Necessary legislation in respect of disaster preparedness should be formulated so that the action become binding onall concerned.	15
At the upazila level Upazila Disaster Preparedness and Intervention Committees may be formed with the officials and peoples representatives. At the district level under the chairmanship of DCs. District Disaster Preparedness and Intervention Committees may be constituted.	9
A disaster information unit should be established within the central disaster administration office to deal with public information and education.	14
Demand for greater regional and international co-operation in disaster management, greater government and NGO co-operation, particularly, in the areas of transportation and communication during relief operation.	7
Media relations should be an integral part of all disaster management programmes and the journalists should be given structured orientation to various aspects of disaster management. The media should be utilised in a concerted manner to ensure dissemination of the information on disaster preparedness, response, mitigation and prevention.	11
Little data exists on flood damage, risk factors and coping patterns, as well as documentation on the pattern of disaster mitigation and people's responses to disasters. There is a clear need for strengthening the data base and conducting research on disasters and their linkage to development. National institutes which have already shown skills and expertise in this field should be supported to strengthen their research capabilities.	11
There should be an integrated approach towards Disaster Preparedness and Management. Linkage should be established among the ministries to make the disaster preparedness programme effective.	99
For overall co-ordination of Disaster Management there should be a co-ordination committee under the PM, with cabinet secretary as convenor and representatives of other relevant Ministries. MOR should provide secretariat.	99
Disaster Management should be done through the Cabinet Secretary who controls the district administrations. DCMU should be placed at a higher level than line ministry (may be under cabinet division)	99
Prime Minister's office should be the most appropriate for Civil/Military co-ordination.	99

MOR should be responsible for relief distribution only. Disaster coordination and Monitoring should be with the cabinet (under PM) during emergency. 99

The existing disaster committees at various level need to be strengthened. 99

A task force should be created at the time of emergency bringing in Disaster Management staff from each concerned Agency. (The MOR may not be suitable for such co-ordination Cabinet Division more suitable). 99

Standing orders should include reference to the depution of senior officers and their relationship with DC/UNO. DC should be responsible for arranging their postings within his areas. 99

There should be NGO representative in the high level committee. NGO Affairs Bureau may play a role in NGO co-ordination with Govt. 99

GOB should plan at Macro level using NGO's at Micro level 99

There is a need to consult local people to understand their concern on the disasters. There is a need for independent monitoring of NGO's efforts. 99

DCMU should have well trained efficient staff of its own. It should have its own establishment. Seconders have divided responsibility and loyalty. 99

Large scale map showing local emergency infrastructure should be displayed at headquarter Ops Room. 99

GOB should prepare report of its activity after every major calamity as is done by the NGOs. 99

D.2.2 Disaster Plans and Training

There has to be a disaster plan,both at the local and national level, long before a disaster takes place. Local organizations must also be part of that plan. 4

Disaster plan should not be seen as an end in itself but a continuous process, it should be a part of day-to-day struggle for survival and include provisions for unfolding the positive dimension of people's saga. 4

a) It must have mechanism of quick flow of information.
b) It must include system of inter-organizational coordination during and after disaster.
c) It must allow educational system to play it part in conscientising students about disaster preparedness.
d) It must be flexible enough and include mechanism of making a transition from relief phase to the developmental one.
e) It must have guidelines for easy implementation.

Infrastructure should be improved for data collection, transmission and forecasting so that it could reach the people and the administration well in advance to take necessary steps to save life and property. 11

There should be two-way communication for dissemination of information regarding diasters, especially for their prediction and warning. 14

In each village relief and rescue teams many be formed with the local inhabitants. At union levels also teams may be formed who will assess damages and distribute relief in time of calamities.	9
Arrangements may be made for training of the personnel associated with relief and rescue operations, so that they can be effective in times of needs.	9
Public awareness and consciousness should be crested to motivate people to face disasters in future. The last cyclone indicated some degree of gap in this respect.	16
Counter Disaster Education and Training Programmes should be included as an essential part of disaster preparedness programme of the country. Such programmes the should aim at creating awareness among the policy makers, disaster managers and the people at large.	11
There should be more emphasis on community preparedness rather than disaster response. If community is prepared they will need less response from out side.	99
There should be a Disaster Management Master Plan and annual plan.	99
Preparedness plan should involve local people and political leaders. Vulnerability mapping at local level needs to be carried out	99
Transport and other facilities for medical relief team should be planned in advance for each cyclone/flood prone area.	99
Air drop platform for high risk zones may be constructed.	99
Standing orders should include reference to NGO's specifying the general principles and mechanism for collaboration between them and the local authorities.	99
GOB-NGO's and Country Boats Association should have joint plan for mobilization of country boats during a disaster.	99
In each union of flood and cyclone prone area there should be mechanics and stores of public health engineering. This will ensure skilled people's availability in the immediate vicinity after a disaster.	99
More community awareness is required. People should be prepared themselves with stores and materials.	99
Civil and Military officers should be trained jointly at BPATC on Disaster Management.	99
There should be a directory of every one in Bangladesh who has attended a formal training course (ADPC, Craufield, IUBAT, PACT) on disaster preparedness.	99
There is a need to develop and make use of audio visual and other materials for training and disaster management. The Government should benefit from materials developed by NGOs. Further developments should be co-ordinated.	99
Deputy Commissioners in coastal areas should have special disaster management courses.	99

D.2.3 Health Sector

Mitigation measures proposed in the health sector of the Fourth Five Year Plan need to be effectively implemented for minimising human suffering after disasters. In addition, adequate local storage of emergency items should be planned. Attention should be given so that funds allocated for the health sector are not cut at the time of a general drive for austerity. 11

Health Sector and Directorate have important role in Disaster Preparedness and Response and therefore, should be fully included in the discussions and planning of disaster management (this has not always been done). 99

Health facilities should be housed in buildings that are designed to withstand the impact of tropical storms, earthquake and flood. Backup electrical and water supply system should be incorporated in hospitals can be ready when their community turn to them for help. 99

There is an urgent need to improve the collection, compilation and analysis of the health information during disaster. The requirement of medical supplies should be realistically assessed. 99

There should be a health disaster preparedness and operational plan at each level of administration. 99

Front line Community Health Programme should be strengthened so that they are better equipped to provide better services during disaster. 99

For timely response - a system should be developed to include development of techniques for hazard mapping, health risk analysis, rapid health need assessment, establishment of a data base, development of specific operational plans, resource management and training of personnel. 99

Disaster preparedness should be developed through the existing health infrastructure based on the primary health care approach. 99

For health emergency preparedness "rescue chains" be set up from-neighbourhood to hospitals so that disaster victims can be transported to proper care. Rescue teams should be trained. 99

Disaster Management should form an integral part of the existing health care delivery system,. Disaster preparedness could commence at the upazila level within the primary health care programme. 99

Health officials below the district level must be trained to anticipate the health needs of vulnerable population and more importantly how to assess their requirements. 99

In the health section there is a need for a common approach emerging among the Disaster cell, Health information system, Health Education Bureau, Disaster Control and Hospital Care unit. 99

Medical College should be geared for specialised health care during emergencies. 99

99

Health Disaster cell itself need strengthening in the following areas:

a) *Data management relating to disaster and disease*
b) *Development of skilled techniques for a rapid health needs assessment during emergencies*
c) *Capability to impart quick training for health personnel to be moved from out side into the disaster area.*
d) *An emergencies communication network between district and upazila level.*

D.3 DEVELOPMENT PLANNING AND DISASTER MITIGATION

D.3.1 General (all disaster-prone areas)

Vulnerability analysis of various areas for different kinds of disasters should be made. Thereafter, risk mapping should be carried out, particularly in the coastal areas. 1

Suitable mitigation plans for the sectors which have not mentioned these issues(industry,power and energy,oil,gas and mineral resources, railways and telecommunications) in the Five Year Plan and Annual Development Programme documents should be formulated and implemented, and resource allocations ensured accordingly. 11

Much potential exists for household-based mitigation through the VGDP programme which needs exploration in consultation with NGOs and local officials. 11

Macro-level mitigation attempts should be integrated into the national planning process, which is normally executed through Five Year Plans and Annual Development Programmes. A suitable model needs to be developed to consolidate sectoral risk factors and benefits into national figures. A disaster fund could gradually be built up so as to allow sustained development of the economy, unaffected by disasters. 11

Surviving in Bangladesh is not merely a question of a vertical relay of information from the centre to the periphery. It needs to be premised on the realities and priorities of people. In the most vulnerable char areas, land tenure is a contested issue and needs to be addressed. 12

Bangladesh needs urgently to move away from its patronage culture to institutionalise popular participation and democratic forms of decision making at all levels, from the national to local village 12

A system is needed by which disaster risks are considered in the design of all development projects. These should include; 99

a) the vulnerability of the project and its intended out come to known natural hazards.

b) possibility of the project creating new hazards or increasing the existing vulnerability of the people and/or economic asset of the vicinity. A process and specific responsibility must be established. Planning commission will have vital role but arrangement must ensure that line ministries consider these aspects in the early stage of project formulation (not at final stage as appear to be in the case of environmental impact assessment).

D.3.2 Coastal Zone/Area (overall planning)

Separate detailed Plan/Programme and also management need to be formulated for the Cyclone/Tidal Bore Zone. 9

An integrated coastal area development programme, based on local farming and fishing practices, should be undertaken as an important medium to long-term measure. Development resources, if effectively co-ordinate, can simultaneously help to build greater resistance to natural disasters. Land management, afforestation, including homestead forestry and human settlement programmes will be early priorities. 10

Relevant experts should undertake immediate survey and feasibility study including precise cost estimates covering the total spectrum of rehabilitation and creation of additional facilities for cyclone protection in the entire cyclone prone area. Experts of concerned Agencies should prepare project proposals, which after due scrutiny by the Planning Commission should be the basis for Foreign Aid 1

negotiation for the massive programme. The following Divisions/Agencies may be directed to prepare projects in their own field of activities in the cyclone prone area:

a) *Relief and Rehabilitation Division.*
b) *Land Administration and Land Reforms Divisionc)Ministry of Local Government and Rural Development.*
d) *Bangladesh Power Development Board.*
e) *Bangladesh Water Development Board.*
f) *Forest Department.*
g) *Bangladesh Inland Water Transport Authority.*
h) *Meteorological Department.*
i) *Roads and Highways Division.*
j) *Establishment Divisionk)Telegraph and Telephone Board.*
l) *Local Govt. Engineering Bureau (LGEB).*

Proposals should be in the form of independent projects (and not as sub-project as was done in 1972-79 IDA project). Each project should be executed by the concerned Agency. The Planning Commission may be assigned the responsibility of overall co-ordination with a view to integrate the projects under the programme to achieve the twin objective of cyclone protection and long-term economic benefit of the people of the coastal area and off-shore islands.	1
Longer term mitigation measures involving dredging of river channels, construction of embankments, safe harbours, afforestation and legislation on habitation of islands should be closely examined.	16
There should be Coastal Area Development Board in each Zone under the chairmanship of the respective Area Commanders.	1
Human settlements in risk Zones like newly emerged chars should be prohibited until the said areas can be made safe for human habitation by afforestation, embankments, construction of cyclone shelters etc.	1
Consideration have to be given for relocation of strategic industries and other strategic installations.	9
Environmental degradation and ecological aspects should receive close attention in development planning, to reduce cyclone impacts.	16
Government ownership of the newly formed chars should be strictly enforced. None should be allowed to live in the char without proper authority. Settlements in the new chars/islands should be made by local administration.	1
Time has come to think of cyclone resistant houses for the coastal belt and off-shore islands of Bangladesh. The ideas of pucca buildings on pillars 12 to 15 feet above the ground level is quite expensive. A number of houses clustered to a village on raised land of the size of one or two football ground(s) raised 15 feet above the ground level and protected by thick mangrove all around should be an idea worth considering.	6
The issue of construction of houses keeping in view cyclone perspectives with indigenous materials, and affordable budget should be looked at very carefully. Separate building codes may have to be developed for the cyclone prone coastal areas.	16
Time has come to think for and design of cyclone resistant houses for the coastal belt and off-shore islands of Bangladesh. The ideas of pucca buildings on pillars 12 to 15 feet above the ground level is quite expensive. A number of houses clustered to a village on raised land of the size of one or two football ground (raised 15 feet above the ground level and protected by thick mangrove all	8

around should be an idea worth considering. However a thorough study and research for design of different types of cyclone resistant houses should be sponsored by the Govt. and other donors considering cyclone disaster, social and economic aspects.

Pier/jetties for off-shore islands need to be constructed. 9

Jetties are needed at Cox's bazar, Kutubdia, Badarkali Moghnama Launch ghat (Chakaria) and Matabari in Moheshkali bazar and also at Chowfaldani. 9

Coastal Protection should be an integrated programme of shelters, Feeder Roads, Embankments, Food shores, Medical services etc. 99

At Mohesh Khali, there should be Radio/Telephone with UNO and VDP units. Also rescue boats and speed boats. Better island communication is required. Jetties and roads to food godown are necessary. 99

D.3.3 Coastal Embankments and Afforestation

Incomplete and damaged embankments should be completed/repaired on priority basis. 1

Additional embankments should be planned to encompass newly settled areas not protected by embankments at present. 1

Durable, surge-resistant embankments have to be built aroundthe off-shore islands and the coastal areas. 9

Cluster Villages outside embankment should be protected by high earthen walls raised by earth from inside the walls. The ditches/wells thus made may be used as sweet water reservoir. 1

Embankments in high risk areas in existence now and those to be built, should have brick surface on top for better communication in bad weather. 1

Embankments should be 15 ft. high with boulders on the water side of the embankment as far as resources permit. 1

Isolated islands should be protected by "Beri Bunds" 10 to 15 ft. high.1New accretions should be stabilised through afforestation before human settlement. 1

Creation of tree shelter belts all round new chars should be given high priority. Banana plantation should be made extensively. 1

There should be close co-ordination and well defined area of responsibility among the Settlement Department, District Administration and Forest Department regarding afforestation and human settlement in the 'chars'. 1

Large scale afforestation programme need to be undertaken to restore ecological balance. We must have a plan for planting at least 10 million trees in the next five years. 9

Domestic forestry should be encouraged. Emphasis should be given on coconut palm, date palm, batlenut & palmyra palm and bamboo groves. 9

Growing trees save lives during the tidal surges as well as provide cashincome and house building materials.	9
Fruit bearing trees also should be planted inside the islands	9
Coastal afforestation with mangrove planting should be undertaken in massive scale.	9
Trees need to be replenished in the reserve forest.	9
Coastal defence against cyclonic events can be improved. ..... Most of the coastal embankments in Bangladesh were not designed to withstand cyclones. Their function is to protect crops against salt water instruction, chiefly as a result of tidal surges, and to defend high-value urban-industrial infrastructure. The best structures will however fail to protect assets if breaches occur.	10
Embankments should be protected by trees. There should be forest belt on the sea side of embankment. There were hardly an damage in areas where embankments were protected by trees.	99
The problem of land acquisition for afforestation on the front and rear of the embankment needs to be resolved by specific law.	99

D.3.4 Flood Areas

Mitigation attempts in the crop sector (e.g., development of new crop varieties and diversification) should be expanded to reduce damages caused by natural calamities such as drought and river bank erosion and to on-rice crops.	11
Research, extension and training activities for crop diversification in non-flood periods and locations should be strengthened.	11
Flood containment measures should be constructed around godowns and silos.	11
Mitigation measures in the forestry sector should include the establishment of new strip plantations, consider tree plantations next to roads and nursery developments.	11
In the fisheries sector, there is a need for the development and management of aquaculture in the flood plains, raising dykes of fish ponds to avoid escape during flood, digging of tanks with wide embankments for sheltering poultry and cattle along with humans.	11
For safe-keeping of livestock in flood-prone areas, government extension activities and NGOs should stimulate the growing of bamboo trees and banana plantations, besides using FCD embankments, roads and other physical infrastructure.	11
Water sector projects involve co-ordination of different line ministries & agencies for alternative uses of water. For achieving optimal uses of water, the recommendations of the National Water Plan need to be vigorously implemented after careful examination by the National Water Council.	11
Mitigation attempts involving roads should pay greater attention to local water management requirements. Construction of standardsroads in flood-prone areas need to be raised.	11
The cluster village programme, besides assisting landless and homeless families, has been found to	11

raise income and resources in their command to face natural calamities and therefore should continue receiving support from donors.

Community mitigation measures constructed within the FFW programme often lack maintenance. Local revenue needs to be generated for proper maintenance of these structures. 11

A part of local government (upazila, municipality) investments should be transferred to the Annual Development Programme so as to relieve government of the counterpart local currency resources used in these investments which could be transferred for co-financing donor-assisted projects and also for the co-ordination of public investment planning. Generation of local revenue for these investments should be given further attention. 11

The efficiency of FCD and FCDI projects needs to be raised through a vigorous cost-recovery drive for financing operations and maintenance activities. 11

In flood-prone areas, it might be useful to ensure a higher standard of construction of schools (e.g., to make these two-storied), so that they can serve as flood shelters in the future. However, a delicate balance is needed between quality and quantity, as one-third of all villages in Bangladesh have no schools at all. 11

For ensuring a supply of uncontaminated drinking water in schools that could serve as shelters, hand pump tubewells should be installed in elevated locations or their platforms raised above flood water level. 11

Major flood mitigation development projects should be undertaken after full environment impact assessment. There should be a plan for evacuation and establishment of temporary shelters for the local people and the centre should be entrusted with the responsibility of ensuring the logistics to execute the plan. 11

Preparation of flood maps indicating vulnerability at different levels of disaster should constitute an integral part of disaster preparedness planning and making of these maps available for public use. 11

Planners should take into consideration of any adverse effects in other areas in the time of development planning of an area and highlighting of remedial measures for protection of those areas. 11

Raised platforms and flood shelters could be built in low lying flood-prone areas. All official buildings should be multi-storied. 99

D.4 WARNING SYSTEMS

D.4.1 Cyclone Warnings (i) Organisation

In the event of formation of a depression in the Bay of Bengal, Meteorological Department, SPARRSO, News Media (Radio/Television), the Relief and Rehabilitation Division, Red Cross and T&T Board should take actions in close coordination simultaneously. 1

The Meteorological Department's Storm Warning Centre should inform the public about the proximity of the outer edge of cyclone and not only about the distance of the storm centre. The warning should be as much area specific as possible. 1

Weather warning should be passed on by Meteorological department to Radio Bangladesh, T&T Board, cyclone Preparedness Programme and Relief and Rehabilitation Division, on telephone and teleprinter/telex simultaneously. Telex/teleprinter link between Meteorological Department and all other concerned agencies mentioned here should be established. 1

The teleprinter connection between Storm Warning Centre at Sher-e-Bangla Nagar, and Radio Bangladesh (which was unserviceable till 2nd June, 1985) should be used at all times for passing weather messages. 1

SPARRSO's responsibility in passing on weather observations to Storm Warning Centre should be made mandatory by appropriate formal order. 1

The Cyclone Preparedness Programme (CPP) should be strengthened and given more resources for: 1

a) Procurement and maintenance of field equipments.
b) Training for volunteers and the public on disseminating cyclone warnings.
c) Conducting exercise of disaster preparedness during pre-cyclone season.
d) Printing and distribution of booklets/posters on disaster preparedness and showing of documentary film in all available media.

The Cyclone Preparedness Programme (CPP) should be extended to those portions of coastal area and off-shore islands which are not yet covered by the Cyclone Preparedness Programme. 1

The existence of CPP wireless network was very effective for warning dissemination, relief and rescue operation. This network should be expanded and strengthened. At the sametime, CPP volunteer equipments need to be quickly replenished and increased. 16

Immediate need has surfaced for extension of CPP network from existing 24 upazilas to a minimum of 30 upazilas. 16

The functions and responsibilities of the Bangladesh Red Cross Society in the implementation of the Cyclone Preparedness Programme (CPP) should be clearly defined.The Upazila level officers of Cyclone Preparedness Programme should be accountable to Upazila Chairman. 1

Emergency Cyclone Disaster Preparedness meeting should be held at Relief and Rehabilitation Division, District and Upazila Headquarters as soon as local cautionary signal No.3 is advised. Control Room should also be activated from this time. 1

Radio Bangladesh, Dhaka should continuously be 'on the air' as long as "Great Danger" from a cyclonic storm persists for any place of Bangladesh (for this purpose Chittagong or Khulna Radio Station is no substitute for Dhaka Radio Station). 99

Meteorological Department, Broadcasting Authority and T&T Boardshould be represented in emergency meetings of the Implementation Board for Cyclone Preparedness Programme (CPP). 1

The 10-tier warnings system for maritime ports and 3-tier warning for inland river ports should be amplified so that the public at large can readily understand their intended meaning and implications. Technical type cyclone warnings primarily meant for ships and ports should be interpreted into easily understandable language for dissemination to the public by radio and television. Such announcement should be made specifying the threatened area. 1

The Radar equipment at Cox's Bazar and Khepupara are about 15 years old. These are likely to have total break-down any time. Their replacement should be made with the highest possible speed. 1

The central co-ordination unit should be connected to SPARRSO by fax for supply of images. 15

The analysis of special weather bulletins indicated an average time gap of 4 hours between observation time and release time of bulletins. ..... The time gap is quite critical from preparedness perspective and should be reduced. 16

CPP training Budget should be doubled CPP should have full time training staff. 99

CPP should have a detailed programme of public education campaign. CPP should have special mass communication cell and capability. Probable needs are: 99

a) National course for TOP officials (and donors separately)
b) District level course (2 days) for district officials and influctually
c) Upazila level course
d) Village level events for village people

The warning system needs to more simplified for ease of understanding of the public (The warning system is good but not understood). 99

DCs, UNOs should have a more clearly defined role in the CPP system but this must not delay the process of transmitting warning and instructions to the local level team leader and volunteers. Target group for the system is rural population, separate systems are needed to alert and protect institutions and infrastructure. 99

Direct Communication Link should be established between Met and Radio Bangladesh. 99

D5.4.2 Cyclone Warnings (ii) Dissemination

Cyclone warning forecasts need to be improved and their inherent meaning needs to be explained to people in simple language so that the credibility gap of the forecasts are reduced and reliability improved. 15

It is clear from the experience that the communication media including journalistic community need to be more seriously involved in cyclone preparedness information dissemination activities. The Department of Mass Communication of the Government had a minimum role in the last cyclone. 16

Forest officials should be trained and equipped for disseminating cyclone warning in any 'char'/island where no Government functionary is available except Forest Department officials. 1

Single band radios should be provided in 'char' area to the Imam of the prominent Mosques or to the Chief of the Cyclone Protection Programme's Volunteers or Primary Schools Teachers. 1

Creation of cluster villages will facilitate dissemination of cyclone warning. 1

Weather warning should be given by display of light signal from high masts. 1

Mass Media should be used for educating public in cyclone preparedness. Wider and effective public education should be arranged on the "DO's" and "DON'Ts" in the event of cyclone warning and action to be taken during and after a cyclone. 1

Government functionaries at union/village level, should be included in the early warning system (Radio, Making, Siren, Light Signal etc.) at that level. 1

In addition to the centrally operated early warning and forecasting system, local warning system may be devised. Inhabitants of the cyclone prone areas may be supplied with transistors sets at subsidized rates. 9

Balloons should be flown as Warning which can be seen further than flag. 99

Access to CPP Radio Network should be enlarged. 99

Mosque, equipped with loudspeakers, should be used for broadcasting warning announcements. 99

D.4.3 Flood Warnings

The river forecast model and the technical forecast operations of the Flood Forecast & Warning Centre (FF & WC) are providing accurate and timely flood forecasts and warnings, in spite of restricted data availability from outside the country. The warning lead times could be extended with additional and more timely data. More intensive employment of RADAR would be useful in monitoring local situations as they develop. 3

The FF & WC provides flood forecasts and warnings for 16 locations although it receives river data from about 50 sites. Warning should cover more locations. 3

Parts of Bangladesh are subject to flash flooding. Heavy rains in the Eastern Hill Basins as well as a number of Northern Districts cause rivers and streams to rise rapidly to damaging levels. The FF & WC has no effective program for this type of flooding. 3

a) The World Meteorological Organization (WMO) should investigate the feasibility of an international data exchange test project similar to the one promoted by UN Region IV between Canada and the United States. All countries in the Brahmaputra and Ganges drainage would be participants.

b) The FF & WC should test the feasibility of a meteorologist working with the river forecast centre to provide rainfall forecasts and RADAR interpretations for flood and flash flood forecasts and warnings.

c) The number of flood forecast and warning points should be increased to provide expanded service coverage.

d) The FF & WC should consider the development of Flood/Flash Flood Watch and Warning programme. The programme would include the preparation of a Flood Guidance for 6, 12 and 18 hour period for use by the FF & WC and Bangladesh Meteorological Department (BMD) for issuing Flood Watches and Warnings.

The major obstacle to completing a well rounded and efficient warning operation in Bangladesh is the ill defined dissemination process at the national level. There appears to be no single Ministry assigned the responsibility to supervise and monitor the distribution of the flood forecasts and warnings through the system after they have been issued by FF & WC. More defined responsibility should be spelled out. 3

The existing organizational arrangement, as designated and described in the ESO, appears to be capable of achieving its flood warning and dissemination mission. The publication "Emergency Standing Orders For Flood" was published in 1984 and requires updating. All Ministries, Divisions, Districts, Upazilas, Unions and other need-to-know groups and persons should all have the latest version of the ESO. 3

a) The Ministry of Relief and Rehabilitation should be assigned the responsibility and authority to immediately transmit the Flood Warning Bulletin down the line. This Ministry has these responsibilities assigned to them for cyclones events.

b) Radio and TV should be given the standing authority to broadcast Flood Warning Bulletins immediately.

c) The existing organisational structure should be strengthened and motivated by additional training and instructions. Each tier of government should know and understand its assignment and be given the authority to accomplish its mission.

d) The ESO should be updated and reissued.

The present flood bulletin does not provide *3*

i) information most users indicated they needed

ii) specific identification or title on the issuance

iii) distinction between flood warning and daily river forecasts; and

iv) is not concise for radio dissemination or for public radio or TV transmission.

The label *"Danger Level"*, as defined in the present daily bulletin, is the river level above which it is likely that the flood may cause damages to crop and homesteads. Flooding at this level does not normally constitute a life threatening situation. ..... the cyclone warning programme uses labels such as Danger Signal No. V, Danger Signal No.VI, Great Danger Signal No. VIII, etc. The use of the word "danger" could cause confusion and misunderstanding. 3

a) The FF & WC should provide specific water level forecasts out to 48 or 72 hours. Included would be the forecast time of the location reaching Flood Level (Danger Level), the crest forecast and time (when possible) and the time the river is expected to go below the Flood Level (danger Level).

b) The present flood warning bulletin needs to be assigned two different headers or titles to identify the products and to reflect the urgency of the information. The titles recommended are ***Flood Warning Bulletin and Flood and River Forecast Statement****. The Flood Warning Bulletin would be used when rivers are forecasted to reach or exceed Flood Levels (Danger Level) and be continued to be used until the river has crested. After the rivers have crested, the Flood and River Forecast Statement header would be used.*

c) Revise the bulletin format to make it compact and the information concise. This will allow for easier transmission and receipt by radio and for uncomplicated broadcast by public radio and TV. The key lines in the proposed format would be ideal for TV trailers.

d) To make it quicker and simpler to copy radio transmissions, all users would be provided with reformatted blank forms which correspond to the Flood Warning Bulletin and the Flood and River Forecast Statement.

e) It is recommended the labels Flood Level or Flood Stage replace the level Danger Level.

The daily bulletin is the primary means the FF & WC uses to distribute the river and rainfall observations. Since it provides no warnings or forecasts, it should not have bulletin in its title.River stations above Flood Levels (Danger Level) are underlined by the computer and then manually 3

underlined with red pencil. This is a time consuming operation and could be done by computer only. The Summary should be made more generally available. It provides information and background at locations other than the official forecast points. It can be used to assess the river trend, provide information for planning at the District and lower levels for flood and evacuation planning and encourage feedback.

a) *The daily bulletin should be assigned a title without the term bulletin. A recommended title is River and Rainfall Summary.*

b) *To speed up preparation of the summary, the red line emphasis could be replaced with a combination of computer underline and Bold format.*

c) *To provide broader dissemination the Summary, could be published in the newspapers during the flood season next to or near the weather forecasts and information.*

Many recipients of the present Flood and Daily bulletins, from the Ministry level down,do not understand,know about or know how to use or obtain the flood forecasts and warning information. 3

At the start of the flood season, the press announces the opening of the FF & WC by a small news item. This news item of a FW lines is generally overlooked or missed. 3

a) *A printed training package should be prepared and distributed to the news and broadcast media and all need-to-know Ministries, groups and persons.*

b) *Before the next flood season, FF & WC should arrange to present a seminar to the senior official and staff of the control room of the Ministry of Relief and Rehabilitation, Ministry of home Affairs (Police), Non-Government Organization (NGO) and any other interested Ministry to provide training on the use of the flood bulletins and its dissemination.*

c) *Before the beginning of the flood season, the warning and communications infrastructure should be exercised on a national basis. Prepackaged flood warnings and river forecasts should be disseminated through the planned process and tracked through the system.*

d) *For public education, it is suggested the Ministry of Information and Broadcast obtain the volunteer efforts of a famous film actor/actress to narrate and appear in a short film and video presentation on flood preparedness and response. Printed Flood Safety Rules could b e distributed to individuals and used to supplement the film and video presentation.*

e) *To provide a more noticeable announcement, newspaper and appropriate periodical advertisements should be used to notify the public and the need-to-know. During the monsoon season, the FF & WC's telephone numbers should be carried in the newspapers in the weather section.*

Flood warning system should be improved with accurate, reliable and updated information and with an adequate lead time. 14

Disaster warning system should be made specific, clear, and credible. 4

There could be FPP of flood preparedness in line with CPP for cyclone. 99

Flood warning could be disseminated by Directorate of Agriculture Extension Block supervisor (2-3 per union) 99

D.5 PREPAREDNESS GENERAL (ALL DISASTERS)

Preparedness must focus on what can be done during the first few days after the impact.	99
Preparedness must focus on empowering local communities to take appropriate action for themselves by providing information, advice and practical help to community leaders.	99
There is a need to develop a cadre of experienced and trained personnel who can make rapid initial assessment of situations and immediate needs on the basis of over - flights and a few spot check visits.	99
Simulated exercise of disaster preparedness should be conducted with the participation of GOB, NGO and armed forces.	99
Grassroot level should be involved by regular drills on community action.	99
In areas of high population density water supply and sanitation should be planned during preparatory stage.	99
There should be emergency food and medicine at the control of upazila administration so that first few days can be sustained till help from out side comes after restoration of communication.	99
There should be strong education programme covering disaster preparedness at grassroot level (health, sanitation, rescue, relief, warning system).	99
Medical Teams should be formed three in each Dist. Five in each upazila, one in each union usually headed by a doctor. These should be activated when a disaster occurs.	99
There should be local plans for searching for survivors and community level planning for providing first aid and for taking survivors (improved) to hospital.	99

D.6 CYCLONE PREPAREDNESS ORGANIZATION AND FACILITIES

D.6.1 Standing Orders and Plans

[The Standing Orders] should be updated ..... then be placed before the Cabinet for approval. Approved copies should be circulated to concerned Ministries, Departments, Corporations, Districts and Upazilas for implementation.	1
Emergency Standing Orders of Cyclone and Preparedness should be reviewed. A brief but more effective standing order may be formulated and put in action.	9
Standing Order of Cyclones should be reviewed in the light of recent experience and a more effective as well as operational standing order should be formulated and adopted.	16
Villagers should be encouraged in Disaster planning and Disaster Management. They should be advised to protect their health and income by raised pumps, preserving seeds and floating seed beds.	1
The absence of contingency plans for cyclones at grass roots & higher administrative levels created problems in preparedness. Contingency planning should be introduced along with orientation for carrying out the exercise and regular practice of the same.	16
Stockpiling emergency relief and rescue materials in the shelters and other locations should be explored.	16
Local production of long shelf-life biscuits and water purifying tablets were also recommended.	7
Government offices in the low char area and off-shore islands should have reserve stock of life buoys; hand pumps and tube-wells and medical facilities.	1
There should be simulated exercise every 6-8 months in cyclone prone areas. Suitable boats for supply of relief by sea to offshore island are required to be earmarked.	99
There should be sufficient loudspeakers at village level in the cyclone prone area and sufficient godowns for emergency supply of food.	99
A sustained, well planned and funded programme should be carried out to maintain national to community level consciousness and preparedness for facing April 1991 like disasters.	16
Large earthen pots burried underground may be used as storage for emergency materials such as matches, fuel, clothes, food, drinking water, etc. People in cyclone prone areas should be trained in such techniques (especially teachers, village leaders, youth).	99

D.6.2 Shelters and Killas

The number of existing cyclone shelters has become inadequate, because of increase in population and habitation in newly emerged chars. More shelters should therefore, be constructed, particularly in high risk areas.	1
Construction of shelters in the new settlements outside embankment should be alloted resources on highest priority.	1

Multipurpose cyclone shelters need to be constructed and the villages should be clustered around them. This will minimise loss of life and property due to cyclone and surges. Indiscriminate spread of houses must be discouraged by law and by administration.	9
Adequate number of cyclone shelters need to be constructed in the cyclone and tidal surge prone coastal areas and off-shore islands.	9
All schools and some strategic places of worship in the cyclone-prone areas have to be constructed in a manner so that they may be used as cyclone shelters in times of disaster.	9
The scale and utility of cyclone shelters, embankments 'killas' (earthen mounds), afforestation and food storage should be extensively examined and decided.	7
Every cyclone centre need to have pucca buildings on raised lands for storage facilities so that essential food, medicine, water, life jackets can be stored during the pre-disaster period. After disaster huge amount of relief goods need to be transported in the affected areas and stored. These storage centre can also be utilized for post disaster storage.	9
During the non-cyclone period, the shelters should be used as schools, community centres, dispensaries, vocational training centre etc. The cyclone shelters should not be used to accommodate post offices, banks, etc., so that the people have easy access to them at the time of emergency. They should be fitted with doors and windows and toilets (presently non existent). They should also be used as communications centres/public call office for which separate office will not be necessary.	1
The protection of life against future cyclones should be assured through a vigorous shelter construction programme. Benefits can be enhanced if such structures are multi-purpose. Institutional arrangements for managing shelters and organising disaster preparedness activities should be urgently established.	10
The gigantic task of construction of multipurpose cyclone shelter throughout the coastal area of Bangladesh will have to be handled by a separate Reconstruction Board (may be in the form of a cyclone shelter construction cell in PWD). ..... co-ordinated efforts and steps should be taken in the management and maintenance of the shelters with the same utmost care and spirit as will be applied during their construction.	16
For proper management, it is necessary that a village level management committee be formed for each cyclone shelter under the overall supervision and control of union parishad. The gram sarker system which is propose to be revived by the present democratic government may also be given responsibility for the management and maintenance. It is envisaged that the committee will meet periodically and decide/suggest ways and means for proper utilization and management of the centres. In this way, the multipurpose nature of the shelters will be ensured in one hand and possible irregularities will be minimized on the other hand.	16
Maintenance is all the more important as all the shelters shall be constructed in the salinity zone. It is suggested that reasonable amounts of fund be placed with the local committee who shall maintain these shelters. Education Ministry can be the main contributor as the cyclone shelters shall be used as primary school during normal time. It is stressed that shelters located in the villages should be the responsibility of the local people and they should also be motivated to share the responsibility for their maintenance.	16

Attempt should be made to construct adequate number of appropriate shelters and killas in cyclone and tidal surge prone coastal areas. The massive investment involved in this calls for research on appropriate designs in construction and procedures for maintenance and management of shelters. Alternative approaches and technologies should be experimented with. 16

Killas should be built for protection of cattles during the tidal surge. They should be built close to the cyclone shelters so that those coming to the shelters can keep their cattles close by. A wall around the top of the 'killas' should be made. Tree plantation should also be made around the top surface of the killa. 1

Shelters should be located with in one kilometre walking distance. 99

Every primary school should be a shelter on raised ground with a tubewell and a VHF Radio. 99

The problem of land acquisition for shelters need to be solved through special simple process and special legislation. 99

All public buildings in cyclone prone area should be made suitable to serve as shelters (rather than building specialist shelters). 99

Any Pucca Building can be used as shelter there is no need for large costly shelters. 99

All new GOB Buildings in cyclone and flood prone area should be multi-storied. 99

There should be a complete programme of school/shelter building. The best "peace time" use of cyclone shelters will be schools (which are relatively less in coastal area). 99

Coconut and other palm trees should be planted on the killas. 99

D.6.3 Shelter Designs

Cyclone shelters of large size (capacity 500 persons) may be made in large villages. In areas where small families are scattered shelters may be made on pillars, one for a number of families. Where shelters cannot be made, a pole with rings may be provided to each household. Approximately 400 shelters (of 500 capacity each) is recommended. Exact size and location should be decided by a site selection committee. 1

Cyclone shelter should be 2 or 3 storied and its ground floor should have no wall as let the surge water pass through 15

From aerodynamic considerations, with possibilities of extreme wind blowing from any direction, the best shape of cyclone shelter would be a building circular in plan. However, circular shaped floor slabs and wall elements would be relatively more difficult to construct, compared to straight edged elements. 16

a) *The proposed design may be based on a twelve sided polygon, closely resembling a circle and offering advantages from points of view of layout of desks and benches for classroom.*

b) *The plinth area of the building is 1750 sft.(163m). The ground floor would be left open and two classes, grades I and II, may be held in the ground floor. The first floor (1750 sft) may accommodate 3 class rooms (e.g. grades II, IV and V) each of which may accommodate 40 students. Besides there are two teacher's rooms, each of approx. 100 sft in floor area. A store may also be provided in the central core. Provisions may also be made for storing items essential for post-disaster.16*

c) *The height of the first floor should be above the highest surge level. This would obviously depend on the location of the school but a minimum height would be 10 ft. above the surrounding terrain.*

d) *In order to minimise the forces produced by the strong current during storm surge, it is recommended that all the columns in the ground floor be section it has also been attempted to minimize the number of columns. A total of 18 columns have been used. Out of there the 12 exterior columns would have the same cross-section. This would simplify construction procedure.*

e) *One possibility of increasing the overall stability of the structure, particularly when subjected to lateral loads from wind and surge forces, it to column bending moments. However, the desirability of this from the aesthetic point of view needs to be investigated further.*

f) *The first floor of the building would provide shelter to about 1000 persons. This is based on the occupancy figure of the existing shelters which were used on the night of 29 April, 1991. Access to the roof is provided through stairs and another 500 persons may take shelter on the roof and stairs, but some of them would be exposed to rains and wind forces. To reduce the wind forces on persons taking refuge on the roof top, consideration may be given to raising the height of parapets.*

g) *A two-storey building would thus accommodate about 1500 personsabout - 1000 fully protected within walls and roofs and 500 exposed to rain and wind.*

For schools requiring larger accommodation, consideration may also be given to a three-storied structure which will accommodate about 2500 persons.

TARA pump should be installed on the first floor of the cyclone shelters to prevent damage and provide water to the people (TARA has 15m suction lift). 99

D.6.4 Transport facilities

Additional feeder road requirement should be assessed in the light of new settlement in the newly accreted area. 1

Network of all weather roads/feeder roads connecting all unionsin the coastal belt and off-shore islands has to be constructedon priority basis. 9

1

Primary road should be made for connecting Upazila and IWT Terminals with the main arterial system/national highways.

All Union Parishad and if possible all cyclone centres should be connected with UZP HQs. by all weather roads. District and Upazila Administration in the off-shore islands and coastal areas need to be furnished with fast, heavy water crafts so that in times of emergencies communication may be established within the minimum possible time. 9

To facilitate evacuation during emergency and transportation of relief goods after cyclones roads should be built of at least HBB standard, as far as resources permit. 1

Water transport facility to off-shore islands and coastal area should be improved. This will include more regular services to these places. 1

As far as resources permit, inhabited off-shore islands and coastal growth centre should have IWT terminals. 1

1

Navigational aids should be provided in the channels which are regularly used as water route.

Sea going/coastal fishing boats should be mechanised. Their carriage of life buoys and radios should be made mandatory.	1
Coastal Upazila Administration should be provided with Motor Launches and speed boats to be used for routine administrative visits to the off shore islands and for emergency evacuation and relief operations. Landing craft of shallow drafts should be provided to the local administration.	1
Sea worthy vessels should be placed at the disposal of the DCs SOS that they may be put to use immediately after any calamity. The Japanese rescue boats which are available now may be distributed on rational basis in different cyclone, surge and flood-prone districts.	11
There should be pucca feeder roads in the off shore islands and in coastal areas generally to facilitate evacuation and relief service.	99
Swandip and other off-shore island should have suitable jetties to facilitate berthing of vessels.	99
There should be helipads in all offshore islands. Large islands should have landing strips to facilitate bulk relief movement.	99

D.6.5 Telecommunications

Communication facilities should be extended for connecting off-shore islands through wireless to the Upazila Headquarters.	1
Communication facilities between the Upazila CPP Officers and the CPP Team Leader of far flung unions and off-shore islands should be established.	1
Civil Administration need to be interlinked with all the UZPs by radio network. In times of disaster it plays the most vital role in relief and rehabilitation operations. During the pre-disaster period it needs to make speedy communication for disaster preparedness.	9

D.7 EMERGENCY RESPONSE

When disasters occur, local government and NGOs should be made accountable for the distribution of relief materials by publicising what has been received and subsequently given out to whom. 11

At the local level, government organisations and NGOs need to work more closely both during natural calamities and in preparedness.

Disaster victims should be given support in the form of material transport, shelter, medicine and food. A good organization tries to provide essential emergency services as well as to engender self reliance among its target groups. It must not allow them to exaggerate their dependency. A dangerous tendency for relief syndrome' develops because of a number of inter-related factors. 13

i) Over crowding of relief organizations in a locality tends to hamper disaster victims and isolate them from their original networks e.g. organization compete to attract victims;

ii) Scarcity of local resources once the emergency operations are over;

iii) Over emphasis on a "dole approach" while motivational efforts by organizations for self help are neglected;

iv) Incorrect information leads to mal-distribution;

v) Incorrect assessment of family and community response;

vi) Exaggeration of loss for political ends;

vii) Disaster may be used as aid magnet by the government.

The limitations of external assistance to island communities for facing cyclone hazards have been further demonstrated in April 1991 cyclone. There is a need for community self-reliance in this respect and volunteers need to be adequately organized, trained, motivated and supported to promote the same. CPP needs to be strengthened for this purpose. 16

The experience of transferring a section of the government administrative secretariat to coastal zones for relief work has been quite effective. The decentralisation of authority and establishment of emergency organisation structure should be made a part of the routine preparedness measure. 16

Local responses to the disaster are instrumental in reducing casualties and accelerating relief activities. This local capability is particularly important since the cyclone cuts the affected area off from the capital in the critical period just after it hit the coast. The role of the Red Crescent Society, NGOs and local groups in this respect merits special mention as does the Government's own arrangements. National disaster preparedness should be based on such capabilities since, whatever their scale, the effects of natural catastrophes are invariably local. Improved communications, including the maintenance of vital health and rural infrastructure such as upazila health complexes and roads, are integral components. 16

A unanimous request by NGOs was for accessibility to wireless radios for communication during the post-disaster period. 7

Government must recognise the logic of human vulnerability and response capabilities, particularlyits differentiation by age and gender. Thus the measure and nature of their support will need tocorrespond to the different needs of women and men; for women are not mere appendages, womenhave demonstrated how effective they are in providing protection to save not only themselves but their children. 16

Formal linkage is necessary between the civil administration, army and NGOs for post disaster operations. 99

Badly affected people should be given relief for an immediate short period as they can not under take Food-for-Work activities after disaster (shock, grief, sickness). 99

There should more GOB-NGO co-operation and co-ordination in post-disaster activities. ADAB should be more active in Co-ordinating NGO's. 99

NGO's should be allowed to bring in emergency communication system. 99

Helicopter resource should be used for actual relief rather than unnecessarily flying VIPs.

Steps should be taken to prevent pilferage of relief materials/supplies. 99

Health service should have dependable detection and reporting system particularly for epidemics. 99

During emergency response, informal volunteers should be used with proper plan. 99

There should be local involvement to search and rescue as they start at that level but assistance is required from upazila, district, Dhaka and outside of Bangladesh. 99

Govt. appropriation for the Ministry of Relief should be increased manyfold, commensurate with the logistic and communication demands for emergency response. 99

In order to enable administrators outside Bangladesh to decide on the scale of required assistance, accurate information on damage and needs should be made available to Foreign missions in Dhaka and the NGO's. 99

There should be more communication equipments/facilities to provide adequate coverage and details of damage assessment and relief needs. 99

Information on local resources in or near the affected areas needs to be kept up-to-date and available to those who can act immediately. 99

Four levels of co-ordination are essential; 99

1) *Information sharing between GOB, NGO and external donors to establish reliable damage and needs assessment*
(2) *Co-ordination of information on external donation*
(3) *Allocation of transport according to type of needs*
(4) *Availability of local and NGO resources suitable tomeet needs.*

UNOs should have mobile wireless set similar to those used by police.Depution of senior officers to disaster affected areas should be planned for cyclone/flood seasons. 99

Mechanism should be established by local authorities to monitor and direct the effort of the NGO's and groups who have taken the initiative to bring relief with little knowledge of the situation or of priorities of different area. 99

During the immediate disaster period their is a need for the preparation and circulation of frequent summary reports of information on the situation and activities of the Agencies. 99

Damage Assessment should be done by local firms of credible capability. 99

Additional tubewell workers and spares be sent in disaster affected area after cyclone. 99

D.8 REHABILITATION

All efforts must be made to create employment for maximum number of people affected by the cyclone. Period for which such employment should be continued should be 12 to 16 weeks until the crops are harvested, the fishing begins and normal economic activities started in a limited scale. Following are the areas in which large number of unskilled people could be employed: 5

i) Repair and re-construction of earthen roads, community houses, schools, madrasas etc.
ii) Agriculture activities.
iii) Shelter construction.
iv) Participation in health education programmes(emphasis for women).
v) Making of fishing nets, boats.
vi) Massive Plantation

Until the embankment is fully repaired only those varieties to paddy which are resistant to saline water should be recommended for cultivation in the area. 5

Seeds of quick growing vegetables such as lal shak, radish, data, kumra etc. should also be provided. A pack of seeds of seven types of vegetables, good for 11 decimals of land would cost only 14 taka. 5

One NGO should not plan and implement rehabilitation programme in complete isolation from that of the others. A Task Force should be constituted to prepare a standard and uniform plan for rehabilitation programme by the NGOs. The plan should have cost estimates, design, information of source of supplies, duration of programme etc. The Task Force should be composed of experienced and senior people from NGOs. Services of freelance consultants, the government officials, engineering and agriculture consulting companies etc., could be hired. The Task force should submit their report for each component of the rehabilitation programme within seven days. .... Excessive variations in costs of different programmes should thus be avoided. (Unit costs of housing proposals of different NGOs vary by 700%). 6

As a guidance to the Task Force the following programme areas are recommended as components of the proposed rehabilitation programme: 6

a) Repair of roads, embankments dewatering of polluted water tanks, repair and reconstruction of houses etc.
b) Social afforestation programme, massive plantation of thick mangrove forest, plantation of fruit trees etc. (Coconut trees have been proved to be cyclone resistant and their mortality rateis very low. Green coconuts has been the first source of pure drinking water to many after this year's cyclone)
c) Provision of seeds and other inputs for saline water resistant paddy and other crops.
d) Making of boats and nets, salt production, loans to organised groups, pisciculture programme, cattle & poultry rearing, etc.
e) Reinforced cement concrete pillar, split multi-bamboo woven walling, wooden/bamboo roof structure, thatched roof, etc.

Bilateral and multilateral donor and the NGO communities Should co-ordinate their programmes among themselves. 6

All the NGO Programmes under the rehabilitation phase MUST be co-ordinated with the Government from the Zonal to the Union levels. 6

The programme for construction of houses should be considered as a priority one. It was seen after the cyclone in 1985 and the devastating floods of 1988, several NGOs constructed different types of houses, with different types of materials at varied coasts. Without limiting the NGOs to use their 8

varied sizes and types of resources and expertise, the following recommendations are made as a sort of general guide for construction of houses.

a) *C.I. (Corrugated Iron) sheets should preferably not be used. In time of cyclone in heavy wind C.I. sheets move and work like sharp razor blades. In this year's cyclone lot of people were injured by flying C.I. sheets. Thatch/straw should be used as roofing materials, although every 2 to 3 years it will need to be replaced in part. There incidents were people have saved their lives floating over or holding thatch roof in water for days.*

b) *Reinforcement cement concrete (RCC) pillars should be used for strength and longevity. Several NGOs have developed expertise in making RCC pillars locally engaging unskilled labourers including women mostly from the beneficiary groups.*

c) *Muli-bamboo may be used for making the roof frame. Split muli-bamboo in the woven form are very common a swelling.*

Information about the availabilities and prices of different materials (e.g. bamboos) should be made available to interested agencies

Massive rehabilitation programme need to be undertaken to compensate the damage caused and to regenerate the economy of the affected areas. More important is the permanent protection measures that are to be undertaken for saving the lives of the people of these areas in future calamities. This programme should be a separate one and not a part of ADP. This approach should also contribute towards greater attraction for the donors. 9

Categorize the entire affected areas according to the severity of the damage caused. Once that is done and uniform rehabilitation programme with costing is prepared then the affected areas should be allocated to the NGOs according to their availability of fund, experience and capacity to administer programme etc. The presence of the organisation in an area and their coverage through development programme should also the considered as an important criteria. 6

NGOs, depending on their resources and capacity, should be allocated geographical areas to run all the components of the rehabilitation programme in that given area. For example if an organisation X has commitment of Y amount of money good for implementing standard NGO rehabilitation programme in 5 upazilas, they should implement all the components of rehabilitation programme in specific 5 upazilas and not outside those. No other NGO should be allowed to work in those upazilas. Smaller NGOs who don't have the resources to implement the total package in one upazila can share either one component in the whole upazila or more than one component in a part of an upazila. A number of like minded small NGOs can form a pool of resources to run either a part or the whole of the standard programme to be co-ordinated by a designated lead agency or ADAB. 6

NGOs [should] restrain themselves from thin coverage in a wide area. Limit them within a given area to implement the whole of the standard NGO rehabilitation programme discussed, argued and agreed well in advance. 6

The representatives of the donors also have a major role and responsibility to influence the implementation of a uniform and standard programme of the NGOs effectively co-ordinated. There is no doubt that implementation of such programme will make the best and maximum use of the resources provided by the donors. 6

While considering the request form individual NGO, the donor should get the application cleared from a central focal point preferably, ADAB, that the application conforms to the standard to NGO programme and in no way duplicates the efforts of other NGOs. The donors should develop co-ordination among themselves through LCG, or a forum similar to that. Funders who do not have representation in Bangladesh should also come under such co-ordination. Funding Agencies should check that the same application has not been forwarded to other donors (submission of same project 6

to more than one donor is quite a common practice). The application should be thoroughly assessed considering the need of the area, management capacity of the organisation and provision for co-ordination arrangement etc.

There should be a "fast track" procedure to deal with the post-disaster rehabilitation projects outside the framework of ADP. Special ECNEC Meeting should be held if needed. 99

ANNEX E

TELECOMMUNICATIONS

ANNEX E

TELECOMMUNICATIONS

E.1 Background

Reliable communications are an essential requirement for effective disaster preparedness and emergency response. During the 29/30 April 1991 cyclone, in-country and international telecommunications were interrrupted due to the collapse of a vital microwave tower at Chittagong. This provides the only link to the Bethbunia Satellite Earth Communications Station (SECS) with the rest of the country. Hence, Bangladesh was cut off from the rest of the world for several days, before services could be restored. Normal communications between Dhaka and the affected areas were also cut for many crucial days.

Immediately after the cyclone the BDRCS/CPP radio network was virtually the only means of communication to and from the affected areas as most of the other communications systems had broken down.

Some foreign agencies, which came forward with offers of assistance at the time of cyclone, wished to operate emergency communication systems to facilitate their own activities and the relief efforts of others. Strict regulations governing the use of radio communications and the importation of such equipment, which are imposed by the Government, prevented the establishment and use of such equipment.

E.2 Preliminary Activities and Difficulties Experienced

In order to find out the details of existing telecommunications networks in the country, visits have been and are being made to the concerned organisations. Discussions have been held with their officials concerning the telecommunications facilities operated by them and details of their performance obtained, especially that during the cyclone of April 1991.

The following organisations have been visited to date:

- Civil Defence and Fire Service Organization
- Flood Forecasting & Warning Centre, Bangladesh Water Development Board
- Cyclone Preparedness Programme, Bangladesh Red Crescent Society
- Inspector General of Police
- Bangladesh Amateur Radio League
- T&T Board, Dhaka
- Ministry of Relief
- Meteorological Office, Dhaka Airport
- The World Bank
- Civil Aviation Authority of Bangladesh (CAAB)
- Multipurpose Cyclone Shelter Programme
- Bangladesh Meteorological Department
- Bangladesh Space Research and Remote Sensing Organisation (SPARRSO)

Key data concerning the systems operated by these organisations are given in an Appendix to this Annex.

Some of the organizations mentioned above will be visited again to collect further information. Other organizations, including the armed forces, which operate telecommunication systems have still to be visited.

Initially, there were some difficulties in contacting organizations but this has been resolved. It was particularly difficult to contact the T & T as most of its officials remained busy all the time.

E.3 Initial Findings

The most important finding to date is that most communications systems did not function satisfactorily during the 1991 cyclone. Generally, their stations, especially in the remote areas, were affected due to antenna being blown down. Some of the affected installations could be restored within a few days but others were not so quickly repaired.

Due to the breakdown of the vital T & T microwave terminal at Chittagong, telephone, telex and fax communications were badly affected, and many of the organizations using T&T leased circuits to Chittagong and Cox's Bazaar could not operate their communications links.

As stated earlier, due to breakdown of the vital microwave terminal at Chittagong, which provides vital links to Bethbunia SECS, international telephone, telex and fax services were disrupted for a few days until such time as alternative routings could be arranged.

E.4 Issues Arising for Clarification

While discussing the licensing requirements for the operation of a radio communication station with the officers of T&T Board, it was learnt that there is legislation governing such activities. Efforts were made to obtain a copy of the relevant legislation. These failed because it was stated that these regulations involve some matters which are "classified". It is rather odd that legislation is "classified". The matter requires to be taken up with the T&T Board at the highest level.

As it stands, obtaining a license for the operation of radio communication equipment and its initial importation from abroad is very complicated. It would be desirable to scrutinise the existing legislation and develop simpler rules.

It is likely that the present rules in Bangladesh reflect former British practices, which were also restrictive. British practice has been updated in recent years in line with modern technology and the same should take place in Bangladesh.

APPENDIX TO ANNEX E TELECOMMUNICATIONS

DETAILS OF TELECOMMUNICATIONS FOR

i) CYCLONE PREPAREDNESS PROGRAMME

ii) MINISTRY OF RELIEF

iii) TELEPHONE AND TELEGRAPH BOARD

iv) BANGLADESH METEOROLOGICAL DEPARTMENT

v) BANGLADESH WATER DEVELOPMENT BOARD

vi) CIVIL AVIATION AUTHORITY OF BANGLADESH

vii) FIRE AND CIVIL DEFENCE SERVICES

viii) POLICE

BANGLADESH RED CRESCENT SOCIETY
CYCLONE PREPAREDNESS PROGRAMME

Telecommunications Network
(June 1992)

1.HF/SSB Voice Communications Network:

Network Details	Mode of Operation	Hours of Operation	Frequency	Remarks
Dhaka-Amtali,Barguna,Barisal, Char-fesson,Chittagong, Chokoria,Companyganj, Cox's Bazar,Dashmina, Daulatkhan,Galachipa, Hatia,Kalapara,Kutub-dia,Lalmohon,Mirsarai, Moiscal,Monpura,Noa-khali,Patherghata, Ramgati,Swandip,Sita-kunda,Sonagazi,Sudha-ram(CharBata),Tajmu-ddin,Teknaf.	HF/SSB Radio Telephone	1000-1030 1430-1500 1500-1530 Hrs	6991.5, 3798,7003 kHz	

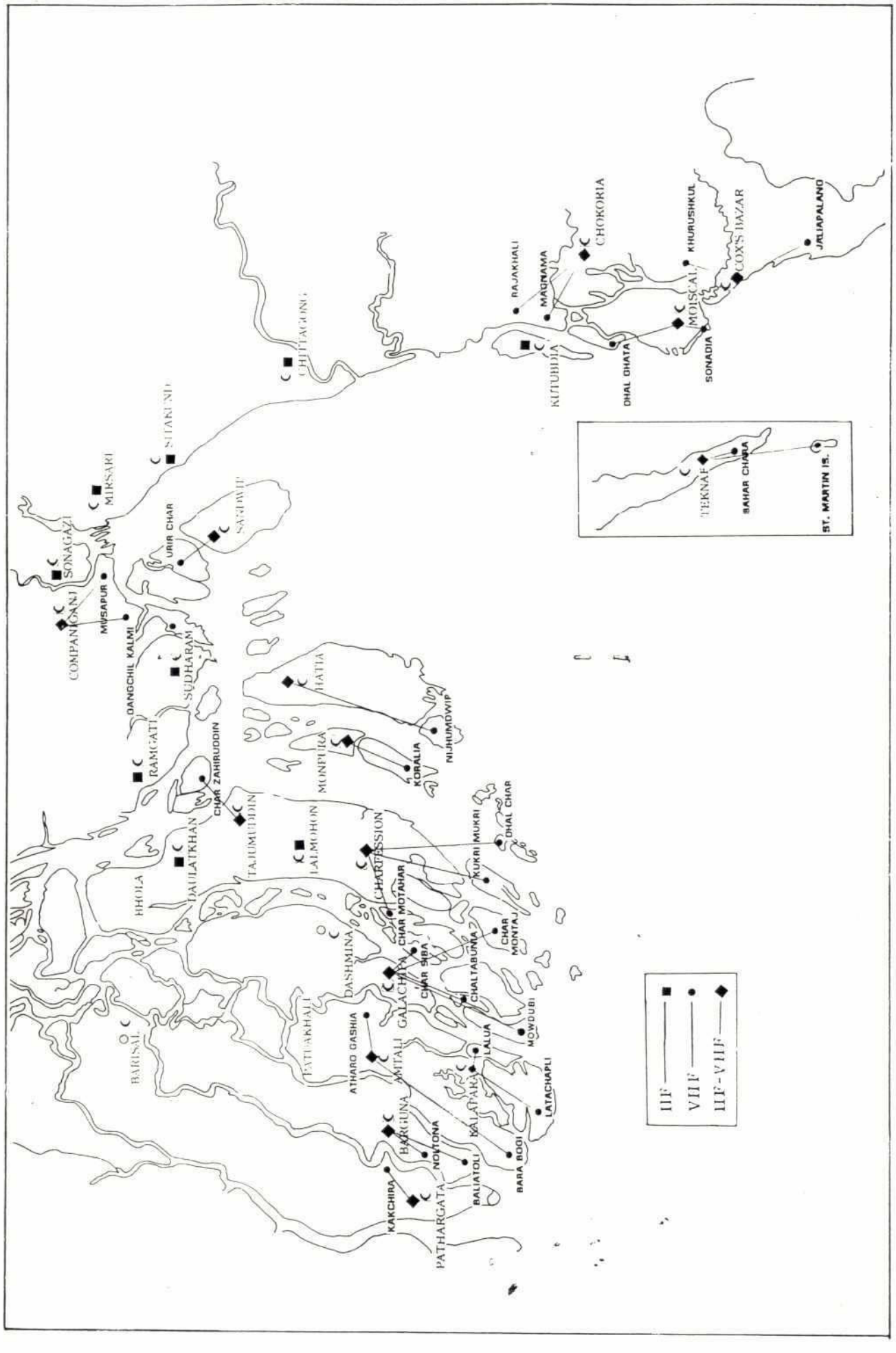
2.VHF/FM Communications Network:

Network Details	Mode of Operation	Hours of Operation	Frequency (MHz)	Remarks
Amtali-Atharo Gashia Bara Bagi	VHF/FM Radio Telephone	11.50-12.10	86.850	
Baraguna-Baliatoli Naltona	VHF/FM Radio Telephone	11.50-12.10	86.875	
Chakoria-Magnama Rajakhali	VHF/FM Radio Telephone	10.50-11.10	86.850	
Charfesson-Char Kukri Mukri Char Motahar Dhal Char	VHF/FM Radio Telephone	11.30-11.50	86.850	
Companyganj-Gangchil Kalmi Musapur	VHF/FM Radio Telephone	11.10-11.30	86.850	
Cox's Bazar-Jaliapalang(Ukhia) Khurushkul	VHF/FM Radio Telephone	10.30-10.50	86.875	
Galachipa-Barabaizdia I Barabaizdia II Char Kazal(Char Siba) Rangabli(Char Montaz)	VHF/FM Radio Telephone	11.30-11.50	86.875	

Cntd. P/2

Hatia-Char Clerk Nijhumdwip	VHF/FM Radio Telephone	10.50-11.10	86.900
Kalapara-Lalua(Nishan Baia) Latachapli(Khajura)	VHF/FM Radio Telephone	11.30-11.50	86.900
Moiscal-Dhal Ghata Sonadia	VHF/FM Radio Telephone	10.30-10.50	86.900
Monpura-Char Nizam Shakuchia(Koralia)	VHF/FM Radio Telephone	11.10-11.30	86.875
Patherghata-Kakchar	VHF/FM Radio Telephone	11.50-12.10	86.900
Swandip-Urir Char	VHF/FM Radio Telephone	10.50-11.10	86.875
Tajmuddin-Char Zahiruddin	VHF/FM Radio Telephone	11.10-11.30	86.900
Teknaf-Bahar Chara St. Martin Island	VHF/FM Radio Telephone	10.30-10.50	86.850

BANGLADESH RED CRESCENT SOCIETY
Cyclone Preparedness Programme
Telecommunication Network Plan



MINISTRY OF RELIEF

Control Room

Telecommunications Facilities
(June 1992)

1.Leased Telephone Network:

Network Details	Mode of Operation	Hours of Operation	Remarks
Dhaka-Barisal,Bogra,Chittagong, Comilla,Dinajpur,Faridpur,Feni, Jamalpur,Jessore,Khulna,Kushthia, Mymensingh,Pabna,Patuakhali,Rajshahi,Rangamati,Rangpur, Sylhet, Tangail.	Leased Telephone Circuit	As required	

2.HF/SSB Voice Communications Network:

Network Details	Mode of Operation	Hours of Operation	Frequency	Remarks
Dhaka-Barisal,Bogra,Chittagong,Comilla, Dinajpur, Faridpur,Feni, Jamalpur,Jessore,Khulna,Kushtia,Mymensingh,Pabna,Patuakhali,Rajshahi, Rangamati,Rangpur, Sylhet,Tangail.	HF/SSB Radio Telephone	10.30-12.30 15.30-17.30 Hrs	7400 kHz	

(The above data to be verified)

389


BANGLADESH
SHOWING MICROWAVE & U.H.F. LINKS
AS STOOD ON FEB 1990
LEGEND:
DISTRICT H/Q
OTHER STATIONS
MICROWAVE LINK
UHF LINK
INDIA (WEST BENGAL)
INDIA (MEGHALAYA)
INDIA (TRIPURA)
ASSAM
MIZORAM
BURMA
BAY OF BENGAL
DHAKA
THAKURGAON
DINAJPUR
PHULBARI
RANGPUR
KURIGRAM
SAIDPUR
GAIBANDA
GOBINDAGANJ
JAIPURHAT
BOGRA
KAHALU
NOAGAON
NATORE
RAJSHAHI
NAWABGANJ
PABNA
KUSHTIA
MEHERPUR
CHUADANGA
TO KRISHNAGAR (INDIA)
JESSORE
MAGURA
NARAIL
KHULNA
SATKHIRA
MONGLA
BAGERHAT
GOPALGANJ
PIROJPUR
JHALAKATI
BARISAL
BHOLA
PATUAKHALI
BARGUNA
FARIDPUR
RAJBARI
TANGAIL
SIRAJGANJ
MADHUPUR
JAMALPUR
SHERPUR
MYMENSINGH
NETROKONA
KISHOREGANJ
SUNAMGANJ
SYLHET
MAULVIBAZAR
BHAIRAB
NARSINGDI
GAZIPUR
MANIKGANJ
SAVAR
NARAYANGANJ
MUNSHIGANJ
DAUDKANDI
COMILLA
CHANDPUR
HAJIGANJ
MADARIPUR
SHARIATPUR
LAKSHMIPUR
BEGUMGANJ
FENI
CHITTAGONG
PATIA
BANDARBAN
RANGAMATI
KAPTAI
COX'S BAZAR
TEKNAF
UKHIA
St Martins Island
DRAWN BY: M. A. MATIN

BANGLADESH METEOROLOGICAL DEPARTMENT

Communications Network
(May 1992)

1.HF/SSB Voice Communication Network:

Network Details	Mode of Operation	Hours of Operation	Frequencies (kHz)	Remarks
Dhaka-Barisal, Bhola, Bogra, Chittagong Comilla, Cox's Bazar, Dinajpur, Faridpur, Feni, Ishurdi,Jessore, Khepupara, Khulna Kutubdia,Maizdi, Mymensingh,Rajshahi,Rangamati, Rangpur, Satkhira Sitakunda, Srimangal,Sylhet, Tangail, Teknaf.	HF/SSB Radio Telephony	H-24	2324,2505, 3363,8814 kHz	Operated once in evey 3 Hrs for receiving MET data at Dhaka from each station.

2.Leased Teleprinter Circuits:

Details of Link	Mode of Operation	Hours of Operation	Remarks
Dhaka - Chittagong Chittagong - Cox's Bazar	Leased teleprinter circuit	H-24	Exchange of MET informations between Dhaka, Chittagong & Cox's Bazar.

3.Cyclone Warning Bulletins:

From	To	Remarks
MET Office Dhaka	Radio Bangladesh, BTV, Cyclone Preparedness Programme, Ministry of Relief, Deputy Commissioners, Shipping Authorities, Newspaper Offices, Dhaka Int'l Airport etc	During cyclone seasons, cyclone warning are tranmitted by telephone, teleprinter, telegraph etc utilising T & T Board communication facilities.

4.Future Plans:

Details of Circuits	Mode of Operation	Remarks
Dhaka-Cox's Bazar Dhaka-Khepupara	Leased microwave circuits	Japanese aid programme Target:1994

5.Leased Data Circuits:

Details of Circuits:	Mode of Operation	Hours of Operation	Remarks
Dhaka - New Delhi	Leased Data Circuit	H-24	Exchange of MET Data between Dhaka and WMO Regional MET Centre at New Delhi at 1200 bauds

BANGLADESH METEOROLOGICAL DEPARTMENT

STORM WARNING CENTRE

Weather Forecast & Warning Dissemination System
Telecommunicatioms Network
(June 1992)

1.GENTEX Communications Network (Partial):

Network Details	Type of Circuit	Hours of Operation	Remarks
MET Com Centre-Chandpur, Chittagong Chittagong CTO, Chuadanga,,Dhaka CTO, Dinajpur,Faridpur, Feni,Hatia,Khulna, Kushtia,Madaripur Court,Maizdi,Mangla, Patuakhali,Rajshahi, Rangpur,Sylhet.	GENTEX Network	24 Hrs	

2.Leased Teleprinter Circuits:

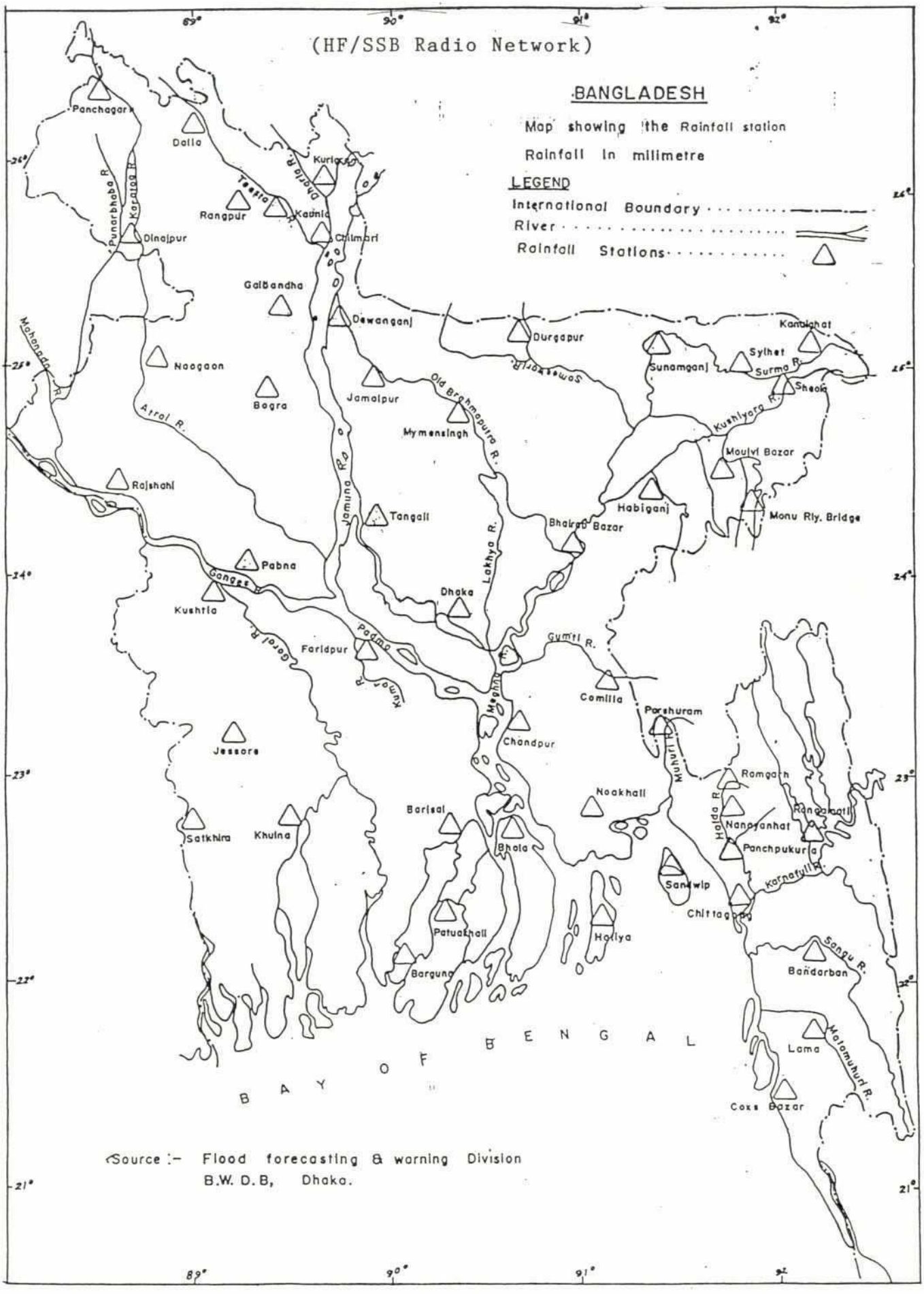
Details of Circuits	Type of Circuit	Hours of Operation	Remarks
MET COM Centre-Bogra,Chittagong #1 Chittagong #2,New Delhi MET Centre, Dhaka CTO,Dhaka Airport,Flood Forecasting Centre, Ishurdi,Radio Bangladesh,Sylhet, Tejgaon/Jessore.	Leased Circuit	24 Hrs	

3.Leased Data Circuit:

Details of Circuit	Type of Circuit	Hours of Operation	Remarks
Dhaka MET Centre-New Delhi MET Centre	Leased Data Circuit 2400 baud	24 Hrs	Under test operation

BANGLADESH WATER DEVELOPMENT BOARD
Flood Forecasting & Warning Division
Rainfall Data Collection Stations

(HF/SSB Radio Network)

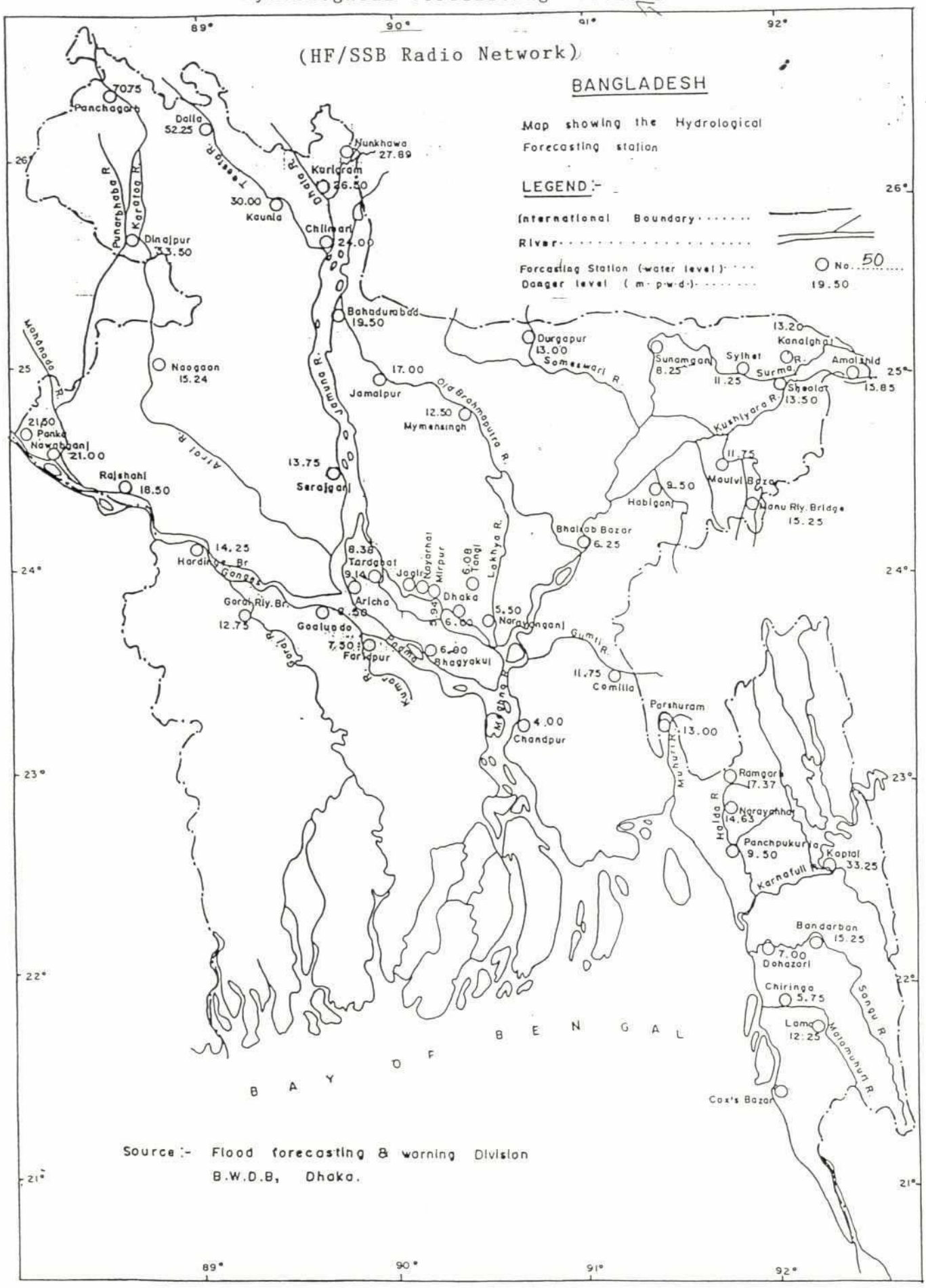


Source :- Flood forecasting & warning Division
B.W.D.B, Dhaka.

DLD

BANGLADESH WATER DEVELOPMENT BOARD
Flood Forecasting & Warning Division
Hydrological Forecasting Stations

(HF/SSB Radio Network)



CIVIL AVIATION AUTHORITY OF BANGLADESH

Communications Facilities
(May 1992)

1.HF/SSB Voice Communications Network:

Network Details	Mode of Operation	Hours of Operation	Frequencies (kHz)	Remarks
Dhaka-Chittagong,Cox's Bazar,Jessore, Rajshahi,Saidpur, Sylhet	HF/SSB	Operating hours of airport	6826,3660 kHz	For co-ordination of air traffic

2.Leased Voice Circuits:

Details of Circuit	Mode of Operations	Hours of Operation	Remarks
DHAKA-CALCUTTA	Leased microwave circuit	H-24	For air traffic co-ordination between Dhaka and Calcutta.

3.Leased Teleprinter Circuits:

Details of Circuits	Mode of Operation	Hours of Operation	Remarks
DHAKA-BANGKOK	Leased satellite circuit	H-24	For exchange of messages relating to air traffic
DHAKA-CHITTAGONG	Leased microwave circuit	Operating hours of airport	For exchange of messages relating to aviation

4.HF Radioteleprinter Circuit:

Details of Circuit	Mode of Operation	Hours of Operation	Remarks
DHAKA-CALCUTTA	HF Radio Teletype	H-24	For messages relating to to Civil Aviation

5.VHF Air-Ground Radiotelephone Communications:

Airport	Mode of	Frequencies	Remarks
Dhaka	VHF/AM	118.3,121.3 121.8,125.7 126.7 MHz	For direct ground-to-air voice communica- with aircraft
Chittagong	VHF/AM	118.7,121.8 MHz	For limited hours
Cox's Bazar,Ishurdi Jessore, Rajshahi Saidpur,Sylhet	VHF/AM	122.9 MHz	Operation for limited hours

FIRE SERVICE & CIVIL DEFENCE
DHAKA

Telecommunications Facilities
(June 1992)

1.HF/SSB Voice Communications Network:

Network Details	Mode of Operation	Hours of Operation	Frequency (kHz)	Remarks
Dhaka-Bhola,Chittagong,Cox's Bazar,Khulna, Maizdi,Patuakhali,Rajshahi.	HF/SSB Radio Telephone	10.00 14.00 16.00 20.00	3570,4530 7350,9905 kHz	

2.VHF/FM Mobile Voice Communication Network:

Network Details	Mode of Operation	Hours of Operation	Frequency (MHz)	Remarks
Dhaka-Hqs 12 Fire Stations in Dhaka City, 3 Fire stations at Narayanganj, 1 Fire Station at Demra, 1 Fire station at Tongi, All fire vehicles	VHF/FM Radio Telephone	24 Hrs	81.0,81.1 MHz	
Chittagong-9 Fire stations at Chittagong City, All fire vehicles	VHF/FM Radio Telephone	24Hrs	81.0,81.1 MHz	
Khulna-5 Fire stations at Khulna City, All fire vehicles.	VHF/FM Radio Telephone	24 Hrs	81.0,81.1 MHz	
Rajshahi-2 Fire stations at Rajshahi City, All fire vehicles.	VHF/FM Radio Telephone	24 Hrs	81.0,81.1 MHz	

BANGLADESH POLICE

Police Telecommnications Network (June 1992)

1.HF/SSB Voice Communication Network:

Network Details	Mode of Operation	Hours of Operation	Remarks
Dhaka Hqs-64 District Hqs	HF/SSB Radio Telephone	24 Hrs	
Battalion Hqs-9 Battalions Uttara,Dhaka.	HF/SSB Radio Telephone	24 Hrs	

2.VHF/FM Voice Communication Network:

Network Details	Mode of Operation	Hours of Operation	Remarks
64 District Hqs-512 Thanas	VHF/FM Radio Telephone	24 Hrs	
Selected Thana-Selected Police Outposts	VHF/FM Radio Telephone	24 Hrs	

3.Leased Telecommunications Circuits:

Details of Circuits	Type of Circuit	Hours of Operation	Remarks
Dhaka-18 District Hqs	Leased Teleprinter Circut	24 Hrs	
Dhaka-Paris	Leased Teleprinter Circuit	24 Hrs	Communication with INTERPOL, Paris
Dhaka-Tokyo	Teletext Service	24 Hrs	International Police Information.

ANNEX F

CONCEPT PLAN FOR INTEGRATED COASTAL PROTECTION

ANNEX F

CONCEPT PLAN FOR INTEGRATED COASTAL PROTECTION

F.1 Preliminary Activities

Preliminary activities have concentrated on:

- meeting concerned government officials and non-government agency staff
- collection and preliminary study of available reports
- field visits to Chittagong and Cox's Bazar cyclone affected areas

Meetings have been held with officials of the Ministry of Relief, upazila local government offices (Banshkhali), the Bangladesh Water Development Board, Ministry of Works and the Forestry Department (Coastal Circle). These have been held in Dhaka and the Chittagong and Cox's Bazar districts and included executive and sub-divisional engineers and officers. Meetings have also been held at the offices of the Multipurpose Cyclone Shelter Project, the Cyclone Preparedness Programme (Cox's Bazar Zone), the Cyclone Protection Project II (FAP-7) and the South West Area Water Resources Management Project (FAP-4). A full list of officials met is given in Appendix F1.

Planning study reports as well as papers and proceedings of relevant seminars have been collected. A list of reference material collected so far is given in Appendix F2.

Field visits have been made to Chittagong, Banshkali, Cox's Bazar, Moheshkhali, Badarkali, Ujantia, Moghnama, Chardalghata, Matarbari and Kutubdia. Embankment repair and breach closure work has been seen as well as afforestation, roads, power lines, jetties, relief godowns, and storm signalling and wireless equipment, in the above areas.

Some indications of the conflicting interests in land use and the resulting impact on cyclone protection were also seen. Notable was the evidence of private development of newly accreted and previous agricultural and forest areas for salt and shrimp production. The apparent absence of planning controls and low level of technology has led to the exposure of these island and main land areas to major losses of life and damage in the April 1991 cyclone.

F.2 Initial Findings

F.2.1 Embankments

Sea-facing embankments are the first line of defence along the coastline against cyclonic surges. Before 1985, repairs to sea-facing embankments were inadequate after each damaging event. Following the 1985 cyclone, medium and long term plans were prepared by BWDB aimed at existing coastal embankments and newly accreted lands respectively (Kampsax et al, 1992).

A mid-term programme for the existing embankments has since been studied under the Cyclone Protection Project II (CPP II), and cyclone protection criteria have been developed for Phase I - the Emergency Cyclone Protection Project. These criteria can be summarised as:

All polders except Polder 62 (Patenga)

Monsoon
1 in 5 year monsoon design conditions. 'No' overtopping (only 13% of waves should overtop the embankment crest).

Cyclonic Storm
1 in 20 year design conditions. Flooding due to waves overtopping the embankment crest should result in the average water depth in the polder not exceeding 1.0 m.

1 in 40 year design conditions. Still water level should not exceed the embankment crest level.

Polder 62 (Patenga)

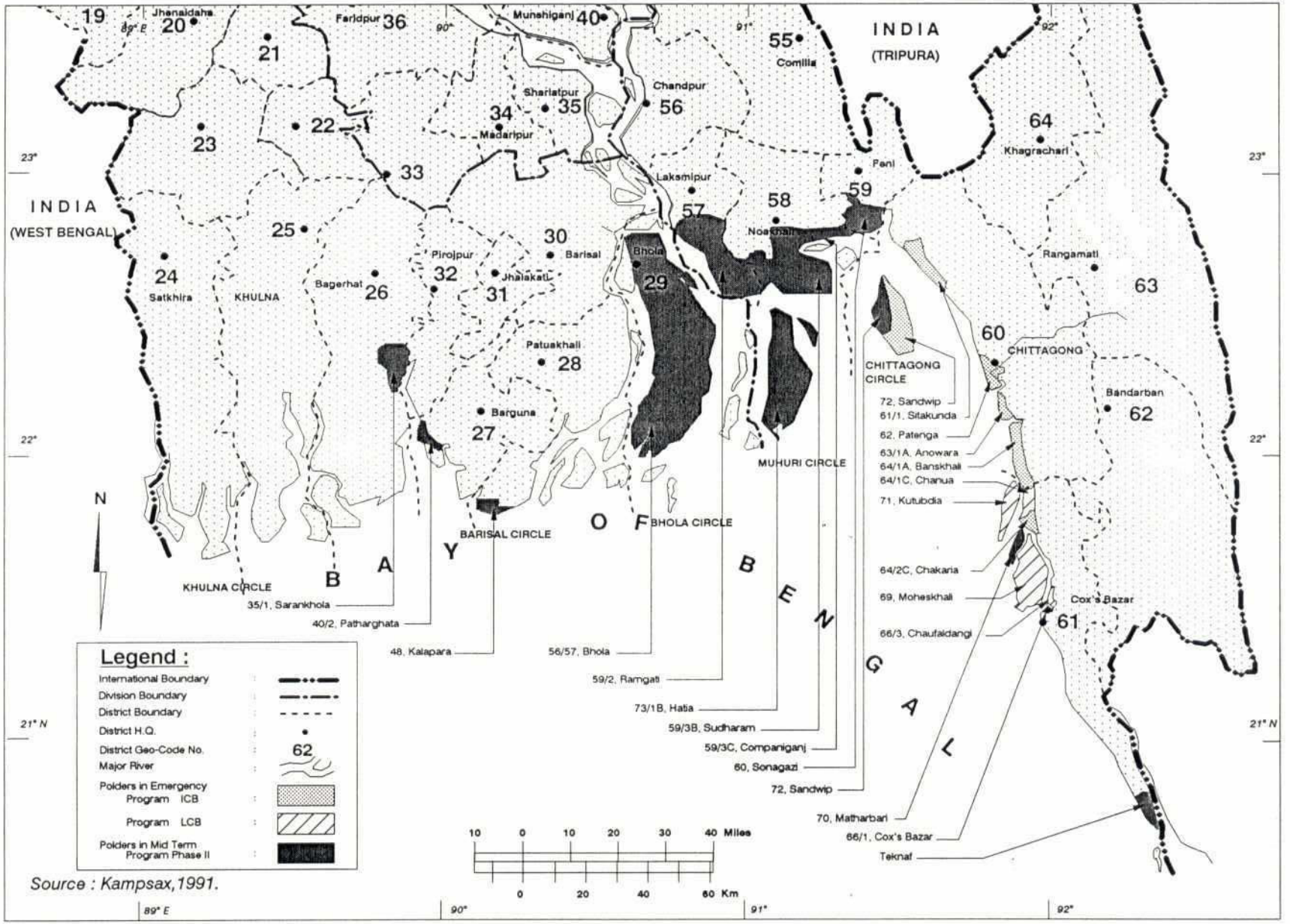
1 in 40 year design conditions. 'No' overtopping (only 13% of waves should overtop the embankment crest).

Tender designs have been prepared and construction of the one year emergency programme is due to start during 1992 (Figure F.1). At the same time, designs and tender documents for Phase 2 are scheduled to be prepared for the remaining works. All works in the mid-term programme are due to be completed by mid 1995.

Surveys carried out under the above studies found that much of the damage caused by the April 1991 cyclone would not have occured had the existing embankments been better maintained. They also found that the areas with embankments shielded by foreshore afforestation were damaged less than areas without. Key recommendations of CPP II include that beneficiaries should be involved in embankment maintenance activities and that afforestation of the foreland and the embankments should be established (Kampsax et al, 1992).

Further studies have been recommended to refine the predictive modelling of cyclonic storms to obtain better agreement with historical data. This should enable refinement of design criteria for further design work with possible significant savings in construction costs.

CPP II is confined to the existing embankments protecting agricultural areas. Some of these areas are now converted to shrimp/salt production (Chakaria, Moheshkali). This has led to private enterprise low technology interventions for water control without regard for appropriate engineering standards. Sea-facing foreshore land available for afforestation is now severely limited and in palces there is pressure for its use for the grazing of livestock. There is therefore a compelling need to reconcile the relative demands on land use in these areas to enable effective protective measures to be implemented.



Source : Kampsax,1991.

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Figure F.1

Rehabilitation of Sea Facing Embankments

Other projects are and have been on-going under BWDB to rehabilitate non-sea-facing polder embankments throughout the 'cyclone' affected coastal areas (EIP, SRP, SSIP etc). This work is believed to be based largely on design criteria which are not in line with the up-to-date surge and tidal assessments of FAP-7. Design criteria for both earthworks and water control equipment (gates) in cyclone affected areas require to be reviewed and up-dated.

Uncertainties concerning Survey of Bangladesh, Public Works Department level datums, and Mean Sea Level remain officially unresolved and are presently under study (FAP-19). A difference of 0.2 m has reportedly been found between the datums of the left and right banks of the R. Jumuna. Such a difference in crest level of sea facing embankments would have a significant effect on the degree of protection provided. The reconciliation and availability of a reliable network of level reference bench marks is a fundamental necessity for achieving intended standards of cyclone protection.

Long-term assessment of probable rises in sea level and the related consequences remains outside current planning criteria. Recognition needs to be given in future rehabilitation criteria to account for projected sea level rise as far as is economically feasible. This has direct implications on the management of the presently proposed sea-facing embankments (CPP II) such that in future they can be modified and raised when necessary without the need to uproot mature trees. A project for the assessment of the effects on Bangladesh of the greenhouse effect and climatic change is presently in progress (BUP/CRU, 1990).

Embankment crest and side slope land use needs to be managed to preserve the embankment strength and integrity. The early establishment of a scour resistent vegetative mat (grass turf) is considered essential to achieving this. Methods such as mulching and spraying on selected seed mixes have been proved to be very successful in areas of tropical rainfall conditions where mechanized construction methods are adopted. They should be introduced to Bangladesh (if not already) and be tried out under CPP II.

Difficulties of quality control in construction of works in dispersed and remote locations are well known and generally acknowledged. Sea-facing embankment construction under local contract procedures will require particular care in supervision to achieve the required standards to avoid failure at the time of a cyclonic surge. No evidence of such care was seen during the site visits.

There is no annual independent assessment of the condition of the sea-facing embankments. To establish and up-date, the condition annually, a system of inspection, monitoring and recording with beneficiary and BWDB involvement is needed. The mapping of embankments prepared under FAP-7 showing the relative condition of embankment section and crest level could form the basis of the recording system. With knowledge of the locations of the least prepared lengths of embankment, contingency plans for targeting emergency repair materials and supplies could be made.

F.2.2 Cyclone Shelters and 'Killas'

Following the 1970 cyclone, 238 shelters and 156 'killas' were constructed throughout the coastal areas under the IDA Coastal Area Rehabilitation and Cyclone Protection Project. Due to various difficulties, the project objectives were only partly achieved (World Bank 1984). A further 79 shelters, including five with associated 'killas', were constructed by NGOs (Inter-Ministerial Task Force (IMTF) July 1991).

Following the 1985 cyclone, GOB constituted the Cyclone Preparedness Committee. This Committee recognized inadequacies in the provision and condition of existing shelters and 'killas'. Multi-purpose use of shelters and construction of a further 400 shelters of 500 persons capacity each, were recommended.

The Multi-Purpose Cyclone Shelter Programme (MCSP) master plan study for shelter and 'killa' construction in the coastal areas is in progress. This was recommended by the Inter-Ministerial Task Force on the construction of multi-purpose cyclone shelters in the coastal areas, set up after April 1991. The six month study started in February 1992 and will provide an overall plan and criteria for the continuing provision, repair and maintenance of shelters and 'killas'. An important issue being addressed is the association of shelters with 'killas' to enable people and livestock to reach safety simultaneously.

In the meantime additional shelters are under construction already in areas hit by the 1991 cyclone. Two hundred shelter/schools are being funded by the Saudi Government and others are being funded by non-governmental organizations. All involve designs previously approved by the Public Works Department. A comprehensive statement of shelters completed and planned to 30 June 1996 is shown in **Table F.1.**

It is noteworthy that few if any 'pucca' buildings were reported to have been significantly damaged during the 1991 cyclone. It is therefore concluded that the various building codes used were sufficient for cyclone prone areas. A Bangladesh Building Code is under preparation and scheduled for completion in 1993. It has been suggested that all government/public buildings in the cyclone-prone areas should be built with a concrete frame and at least two storeys in height, in order to be able to serve as shelters. This would be a sound policy.

There is a need for integrated planning and implementation of fish ponds, 'killas' and associated cyclone proof community buildings. Suggestions have been put forward for providing multipurpose shelters on top of 'killas'. The opportunity could be taken of providing basement storage beneath such buildings. This would economise on earth fill and provide valuable space for storing relief supplies and potable water. At the same time problems of building foundation design and construction could be minimized.

F.2.3 Cluster Villages

Following the 1985 cyclone and largely in response to the loss of life and devastation in newly settled chars, the concept of nucleus housing was used in re-establishing villages on Urir Char. In this concept, individual family cyclone

TABLE F.1
Cyclone Shelters and Schools-cum-Shelters

Responsible	Funded by	Completed by 30th June 1991	Planned for completion by 30th June 1992	1993	1994	1995	1996
PWD	?	100 (1)	100	100	100	100	100
PWD	IDA	238	238	238	238	238	238
BDRCS	Various	62	102	162	227	227	227
CARITAS	Various	12	37	67	110	162	162
LGEB	Japan	0	0	20	40	40	40
MOE	Saudi Fund	0	0	100	200	200	200
MOE	Japan	0	0	20	40	60	60
MOE	EC	0	0	60	130	200	200
CCDB	Various	0	0	25	50	75	100
Grameen Bank	Self ?	0	0	10	20	20	20
BRAC	Self ?	0	0	8	16	16	16
CHCP	Various	0	0	1	2	3	3
Other NGOs	Various	0	0	40	80	120	160
	Total	**412**	**477**	**851**	**1253**	**1461**	**1526**

Sources : BUET, 1992, CARITAS, 1991; BRCS, 1992

(1) Coastal and sub-coastal community centres built in 1960s, largely abandoned (BUET, 1992).

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proof houses were constructed in groups around fish ponds. About 260 such units were built, however their cost was high. Various proposals for low cost cyclone resistant housing units and shelters have been put forward by the Ministry of Works Committee on Cyclone Shelters (IMTF 1991, LGEB 1991).

F.2.4 House 'strengthening' loans

The large quantity of C.I. Sheet distributed following the April 1991 cyclone has been used for the roofing of both small houses of simple construction and also larger buildings including schools. Experience shows that roofing sheets get blown about in cyclonic winds with very dangerous consequences to people moving from homes to shelters. Small houses may not have substantial structural frames or foundations. Roofing sheets are often not anchored adequately to the supporting purlins and trusses which in turn may be insubstantial or not adequately incorporated into the building structure.

There is a need to provide for the strengthening of village buildings at least to the extent that they fail safely and with minimum danger to third parties during damaging cyclones. The idea of making loans available for the strengthening of buildings to make them cyclone resistent has been suggested and needs to be considered.

F.2.5 Water Supply

The most urgent requirement immediately following inundation due to a storm surge is for re-establishment of fresh waster sources. At sites visited and shelters seen under construction in May 1992, hand pump tubewells had been installed to a depth of typically 650 feet to produce sweet water. At one long established site a hand pump had been replaced by an electric pump. The hand pump was re-installed on the first day after the 1991 cyclone as, in the absence of power, the electric pump could not work. Such contingency, arrangements should not be overlooked as development progresses in cyclone prone areas.

Recent approval has been given by ECNEC for the construction of five thousand deep tubewells in the cyclone-affected areas (Bangladesh Observer 14.05.92). It is believed that there has been no thorough investigation into the extent and yield of deep aquifers in the coastal areas. Inferences are thought to have been drawn from limited information available from deep borings but no firm information on sustainable yield has been determined.

There appears to be a need for a systematic investigation of groundwater resources in the coastal areas. The results of such a study could affect future coastal area development plans and the siting of settlements and shelters.

F.2.6 Rural Electrification

The relative cyclone resistance of the precast concrete 11 KV distribution poles was very evident during the field visit. On the otherhand, tall lattice pylons were blown down at the major waterway crossing between Badarkali and Moheshkali Island. Plans and standards for power distribution should be part of the integrated plan for the coastal areas and appropriate design criteria adopted consistently.

F.2.7 Roads

In addition to sea facing embankments, designs and tender documents for a pre-selected programme of road construction and rehabilitation in cyclone affected areas have been prepared under CPP II. Following the April 1991 cyclone, this programme was modified and a revised programme identified. There is a need for this programme to be reconciled with the planning of groups of shelters and also for the identification of feeder roads.

The state of preparedness of the trunk and feeder road network needs to be kept under annual review to enable the direction of relief transport in the most effective way. One of the chief shortcomings immediately after the 1991 cyclone is reported to have been lack of usable roads. Trunk and feeder roads need to be part of an integrated disaster and relief transport system.

F.2.8 Helipads, Drop Zones and Landing Strips

The effectiveness of helicopters in assisting with the distribution of relief food immediately after the 1991 cyclone is generally recognized. Short take-off and landing (STOL) aircraft could also be employed where landing strips are available or constructed. The location of designated helipads, drop zones and landing strips, including the construction of helipad 'killas' and landing strips needs to be defined as part of an integrated disaster and relief transport system.

F.2.9 Harbours, Jetties and Safe Anchorages

Harbours, jetties and safe anchorages provide facilities both for the safety of vessels during cyclones and for the distribution of relief afterwards.

Apart from Chittagong, and to a lesser extent Cox's Bazar and Chandpur, there appear to be no significant harbours along the eastern coastline, in the Meghna Estuary, or along the western coastline. Inland waterway vessels, however, appear to find shelter without great difficulty away from the coastline and major boundary rivers.

Vessels sank in the port of Chittagong during the April 1991 cyclone. Mongla, although in the coastal area, is inland from the coastline. Inspite of this vessels are reported to have sunk during a previous cyclone. The district ports of Barguna and Patuakhali which are further inland have not reported any sinkings.

Sheltered landing sites at islands and in tidal estuaries with silty water are normally subject to siltation and require jetties for berthing at low tide. In the Cox's Bazar District there is a recently constructed permanent jetty at Moheshkali. This jetty survived the April 91 cyclone with only superficial damage. There is only a temporary wooden jetty at Cox's Bazar.

Needs for permanent jetties have been expressed by BWDB and Cyclone Preparedness Programme officials. Locations given are for Cox's Bazar, Badarkhali, Ujantia, Moghnama, Chardalghata, Matarbari and Kutubdia. Possible needs for facilities at Sandwip, Bhola and elsewhere have yet to be identified.

Investigations to confirm and determine the locations and feasibility of providing jetties and other anchorage facilities are required. Harbours, waterways, jetties and rescue vessel (life boat) requirements need to be planned as part of a disaster and relief transport system.

F.2.10 Medical Facilities

Hospitals, dispensaries and stores containing relief medical supplies, all form part of the disaster preparedness and response system. The distribution of these facilities in cyclone resistent buildings located strategically throughout the cyclone prone areas, and in relation to community groups of shelters, should be reviewed and requirements identified.

F.2.11 Afforestation

The value of afforestation in reducing local wind strength and surface water waves has long been recognized.

Planning is known to be in progress to include for afforestation of the forelands in front of the proposed sea facing embankments wherever they are set back and where they are to be re-sectioned. The only exception is where there is existing afforestation or natural forest. Both IDA and ADB are believed to be actively pursuing proposals for this work to be implemented at the same time as the embankment construction work. These proposals are known to involve local voluntary participation. This approach has already been initiated by CPP. Details of the proposals need to be collected and incorporated into the concept plan.

Different opinions are known to exist concerning the benefits and risks associated with establishing afforestation on the side slopes of protective embankments. There needs to be a thorough examination and review of the experience obtained in countries which have a long history of polder development and where pressures on land use have had to be balanced with the long term safety standards required.

The association of afforestation with multi-purpose shelters, 'killas' and other community building works is being included in the Multi-Puprose Shelter Programme master plan due for completion in July 1992.

There are particular problems of sustaining afforestation on foreshores where erosion removes accreted land. Examples of this are affecting Sandwip and other islands. Low cost measures to stabilize such coastlines using artificial seaweed deserve consideration and review under FAP-5b. Such measures have been shown to withstand harsh sub-sea scour conditions at a fraction of the cost of equivalent hard defences (King, 1992).

F.2.12 Communication Facilities

Meteorological facilities, including radar, are presently installed at Dhaka, Kalapara and Cox's Bazar. Routine weather observations are also made daily by SPARRSO. These facilities are used for cyclone detection and tracking. The meteorological station network, used for maritime and aviation news bulletins, also

provides essential support in monitoring relevant observations and in the distribution of warnings issued by the Meteorological Office at Dhaka.

An idea for additional facilities for the early detection and tracking of the cyclonic surges at sea has been suggested (IDNDR 1990). It would consist of a system of buoys anchored at sea, terrestrial reference stations and global positioning system (GPS) satellite communications, to detect the wave trajectory of the surge. It is possible that such a system could provide a gain of several hours and improved prediction and warning.

Radio and TV broadcasts are important means of issuing warnings. Problems of providing adequate detail for local areas could be overcome by setting up local radio/TV stations which would issue bulletins easily understood by local inhabitants. These could be repeated in dialect as appropriate.

There are needs for strengthening the T&T communication system. Suggestions have been put forward for providing additional microwave routes to provide a fail safe network, and to introduce HF mobile phone networks throughout the areas.

F.2.13 Sea Brakes

At present, the full force of the storm surge is spent at the coastline. The embankments resist the pressure of the sea rise and some of the kinetic energy is absorbed by the frictional resistance of any local afforestation. Where embankments are insufficiently high the residual surge overtops and spreads over the countryside gradually dissipating itself against the frictional resistance of the features of the land surface.

Although the detailed nature of the surge wave is not fully understood its general form and behaviour can be modelled. It has been suggested that an arrangement of sea brakes could be constructed on the shore to reduce the force of the incident surge wave before it reaches the coastline (IDNDR 1990). Proven techniques of construction including dredging and sea bed protection could be considered. Such measures could be associated with the acceleration of near-shore accretion where conditions are favourable.

F.2.14 Integrated Coastal Areas Development

An integrated system of measures for coastal protection requires coordinated planning and management. This necessitates inter-ministerial policies and decision making on plans drawn up jointly by the authorities responsible for the development of the coastal districts. A Coastal Areas Management Programme could be conceived as a rolling programme of coordinated development projects with shared aims of cyclone protection, resource management, and sustained economic development.

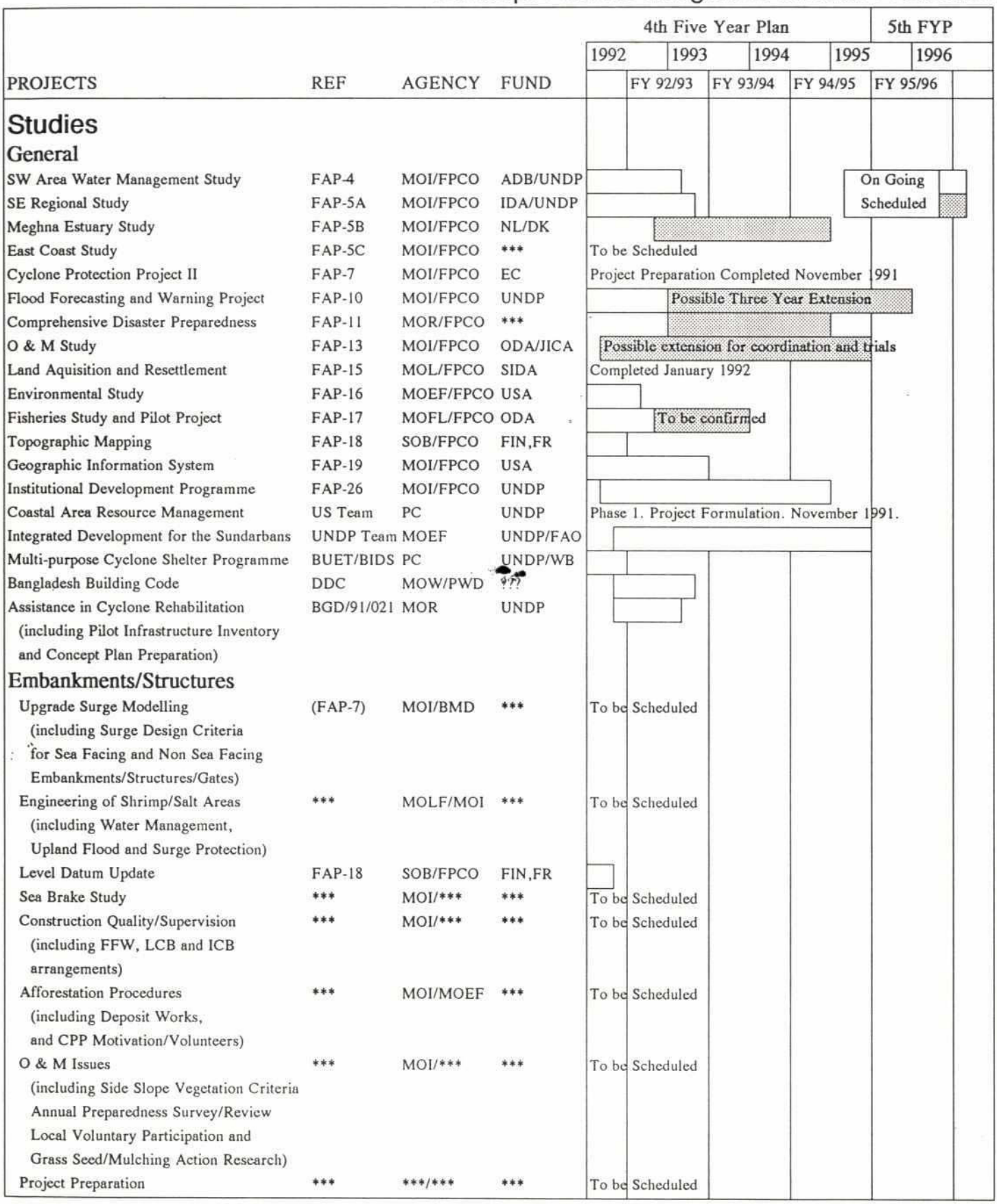
Recommendations for integrated coastal area development have come from many sources (ESCAP, 1987. Moudud et al (CARDMA), 1988. NEMAP, 1991. Mokammel Haque (SHEBA), 1991. Clark et al, 1991. Kampsax et al, 1992) as well as the press (Bangladesh Observer 15 and 16.5.92). These recommendations need to be reviewed and the institutional requirements and implementation framework

established with coordination at the highest level. Recent experience (IFAD, 1991 Special Assistance Programme to Cyclone Affected Households) would support the suggestion that this coordination might best be provided at the Planning Commission or Cabinet level with a National Steering Committee under the Chairmanship of Cabinet Secretary and with concerned Secretaries as Members (Agriculture, Water-development, Fisheries, Environment and Forests, Local Government, etc.). This would provide an umbrella for coordinating all the present activities. Such a model would enable joint action programmes in related fields.

Figure F.2 lists all the projects that have been identified to date. This list will be expanded as the assignment progresses.

Figure F.2

Concept Plan for Integrated Coastal Protection

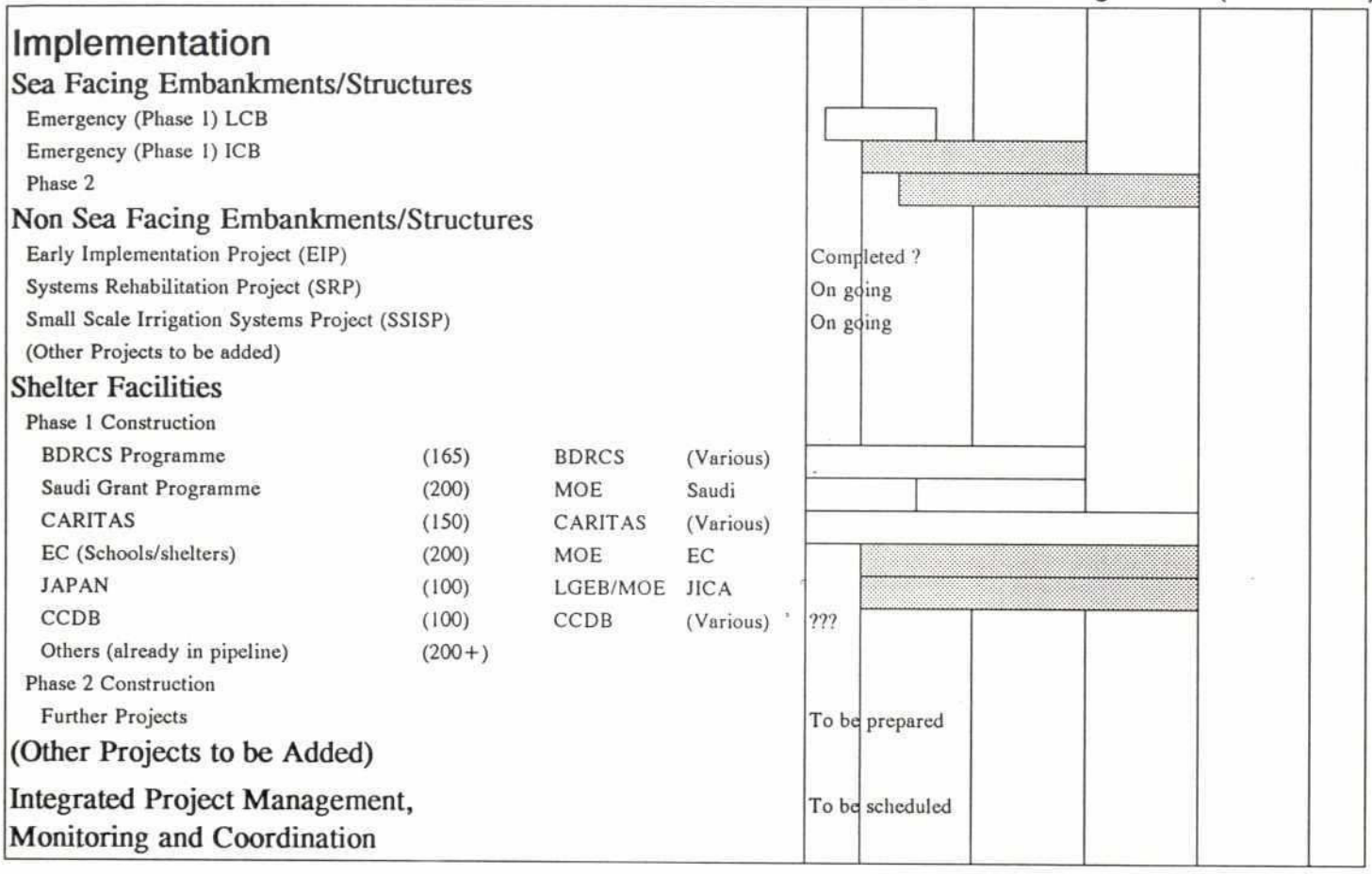


PROJECTS	REF	AGENCY	FUND
Studies			
General			
SW Area Water Management Study	FAP-4	MOI/FPCO	ADB/UNDP
SE Regional Study	FAP-5A	MOI/FPCO	IDA/UNDP
Meghna Estuary Study	FAP-5B	MOI/FPCO	NL/DK
East Coast Study	FAP-5C	MOI/FPCO	***
Cyclone Protection Project II	FAP-7	MOI/FPCO	EC
Flood Forecasting and Warning Project	FAP-10	MOI/FPCO	UNDP
Comprehensive Disaster Preparedness	FAP-11	MOR/FPCO	***
O & M Study	FAP-13	MOI/FPCO	ODA/JICA
Land Aquisition and Resettlement	FAP-15	MOL/FPCO	SIDA
Environmental Study	FAP-16	MOEF/FPCO	USA
Fisheries Study and Pilot Project	FAP-17	MOFL/FPCO	ODA
Topographic Mapping	FAP-18	SOB/FPCO	FIN,FR
Geographic Information System	FAP-19	MOI/FPCO	USA
Institutional Development Programme	FAP-26	MOI/FPCO	UNDP
Coastal Area Resource Management	US Team	PC	UNDP
Integrated Development for the Sundarbans	UNDP Team	MOEF	UNDP/FAO
Multi-purpose Cyclone Shelter Programme	BUET/BIDS	PC	UNDP/WB
Bangladesh Building Code	DDC	MOW/PWD	???
Assistance in Cyclone Rehabilitation (including Pilot Infrastructure Inventory and Concept Plan Preparation)	BGD/91/021	MOR	UNDP
Embankments/Structures			
Upgrade Surge Modelling (including Surge Design Criteria for Sea Facing and Non Sea Facing Embankments/Structures/Gates)	(FAP-7)	MOI/BMD	***
Engineering of Shrimp/Salt Areas (including Water Management, Upland Flood and Surge Protection)	***	MOLF/MOI	***
Level Datum Update	FAP-18	SOB/FPCO	FIN,FR
Sea Brake Study	***	MOI/***	***
Construction Quality/Supervision (including FFW, LCB and ICB arrangements)	***	MOI/***	***
Afforestation Procedures (including Deposit Works, and CPP Motivation/Volunteers)	***	MOI/MOEF	***
O & M Issues (including Side Slope Vegetation Criteria Annual Preparedness Survey/Review Local Voluntary Participation and Grass Seed/Mulching Action Research)	***	MOI/***	***
Project Preparation	***	***/***	***

Figure F.2 (Continued)

Shelter Facilities/Killas									
BDRCS/DPP Development	***	***/***	***	To be	Scheduled				
Project Preparation	***	***/***	***	To be	Scheduled				
Telecommunications/Warning Systems									
Preliminary Review	BGD/91/021	MOR	UNDP						
CPP Development	***	***/***	***	To be	Scheduled				
BMD/BTV Link	***	***/***	***	To be	Scheduled				
Telecommunications in High Risk Areas (including Emergency Radios and High Freqency Networks)	***	MPTT/***	***	To be	Scheduled				
Additional Microwave Routes	***	MPTT/***	***	To be	Scheduled				
Radio Buoy Surge Tracking	***	MOD/BMD/*	***	To be	Scheduled				
Project Preparation	***	MPTT/***	***	To be	Scheduled				
Transport Systems									
Transportation Study in High Risk Areas (including Trunk/Feeder Roads, Bridges, Shipping/Harbours/Jetties, Helipads/STOL strips/Drop zones, Rail Network, and Rescue/Relief Vessels/Craft)	***	***/***	***	To be	Scheduled				
Project Preparation	***	***/***	***	To be	Scheduled				
Utilities/Services									
Groundwater Investigations	***	***/***	***	To be	Scheduled				
Potable Water/Sanitation	***	***/***	***	To be	Scheduled				
Power Distribution System Design Criteria Update	***	***/***	***	To be	Scheduled				
Project Preparation	***	***/***	***	To be	Scheduled				
Social/Relief Systems									
Agricultural Rehabilitation (including BADC pumps, Power Tillers, Seed and Fertilizers etc.)	***	MOAF	***	To be	Scheduled				
Preliminary Social Studies	BGD/91/021	MOR	UNDP						
Social Issues (including Womens Issues)	***	***/***	***	To be	Scheduled				
Relief Storage Systems	***	***/***	***	To be	Scheduled				
Medical Facilities	***	***/***	***	To be	Scheduled				
Burial Services	***	***/***	***	To be	Scheduled				
Project Preparation	***	***/***	***	To be	Scheduled				
Environment									
Environmental Issues (including Mangrove Conservation, Shrimp/Salt areas Soils, Channel Siltation, Near Shore Accretion/Erosion, and Sand Dune Stabilization)	***	MOEF	***	To be	Scheduled				
Afforestation General Criteria	***	MOEF	***	To be	Scheduled				
Erosion Control Action Research	***	MOI/MOEF	***	To be	Scheduled				
Fisheries									
Shrimp/Salt Areas Criteria	***	MOLF/***	***	To be	Scheduled				
Coastal Fisheries Study	***	MOLF/***	***	To be	Scheduled				
Project Preparation	***	MOLF/***	***	To be	Scheduled				
Land									
Land Use Planning Study (including Motivation and Land Registration Procedures)	***	MOL/***	***	To be	Scheduled				
Integrated Project Preparation	***	***/***	***	To be	Scheduled				

Figure F.2 (Continued)



APPENDIX F1 : OFFICIALS AND PEOPLE MET

Date	Organisation	Name	Designation
May			
23	Ministry of Relief	A.Z.M.Hossain Khan	Joint Secretary
	Dev.Dsgn.Cons.	Prof.J.R. Choudhury	Team Leader MCSP and Panel Expert
	Kampsax JV	Bjarne Mathiesen	Team Leader CPP II
	Sandwell Inc	R.A.B. McFarlane	Team Leader Forestry
24	FPCO	Gulzar Hossain	XEN
	Dev.Dsgn.Cons.	Dr A. Nishat	Panel Expert
26	MOEF	Ali Akbar Bhuiyan	PD Afforestation
27	Kampsax JV	Bjarne Mathiesen	Team Leader
28	Consultants to MOR	M. Siddiquer Rahman	Panel Expert
	Sandwell Inc	R.A.B. McFarlane	Team Leader
	Sandwell Inc	Wit Treygo	Planner
	MOLF	A.Z.M. Naziruddin	Secretary LF
	Italian Embassy	Dr.B. Ragone	Project Manager
30	BWDB	Lutfur Rahman	SE CTG
	BWDB	Mohd.Hamidul Haq	XEN CTG II
	BWDB	Essanur Rashid	SDE (Patenga)
	BWDB	Waliuzzaman Khan	SDE (Banshkhali)
	CTG Port Authority	Captain A. Islam	Dep.Conservator (Actg.)
	MOR	--	DRRO CTG
	MOEF	A.K.M.Samsuluddin	DFO Coast.Aff.Div.CTG
	MOR	--	OC Supply Depot CTG
31	BWDB	Waliuzzaman Khan	SDE Banshkhali
	T&T	--	PCO Operator
	Upazila Banshkhali	M.Morshad Choudhury	Assistant Commissioner
	MOEF	M. Ibrahim	Asst.Chief (Planning)
June			
1	BWDB Cox's Bazar	M.A. Kassem	SDE Badarkhali
	MOR	Haradhan Sin	DRRO
	Met.Office	M Haque Khan	Meteorologist
	CPP	Abu Kassem Sarker	Zonal Officer
2	BWDB Cox's Bazar	M.A. Bari Talukdar	XEN Cox's Bazar
	Upazila	K.C. Mondal	UNO Moheskhali
	CPP	N.Absar Choudhury	PIO
	CPP	Tajul Islam	Development Officer
3	BWDB Badarkhali	M.A. Kassem	SDE
	MOF	M. Faizur Rahman	OC Local Supply Depot
4	BWDB Cox's Bazar	M.A. Bari Talukdar	XEN Cox's Bazar
6	LGEB	Per Bertilsson	CTA
7	Halcrow	John Gardner	Coastal Engineer
16	PWD	Shah Alam Zahiruddin	Chief Architect

APPENDIX F2

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ANNEX G

SUMMARY REPORT OF INFORMAL WORKSHOP AT MOR/DCMU ON 17 JUNE 1992

ANNEX G

SUMMARY REPORT OF INFORMAL WORKSHOP AT MOR/DCMU
17 JUNE 1992

The workshop was convened to provide an opportunity for a free and frank exchange of views concerning priority problems in disaster management, and what can be done (the specific actions required) to resolve them. The principal invitees were the focal points for disaster response in the various government bodies listed in the Standing Orders. Others included members of the Project Team, the Professional Panel, and UNDP. The attendance list and a copy of the programme are appended.

The specific objectives were:

(i) to identify feasible actions needed, on an inter-sectoral/ inter-departmental basis, to reduce losses caused by cyclones and floods, and to improve response to disasters of all kinds; and

(ii) to initiate an inter-sectoral dialogue on disaster management issues and suggest areas on which the DCMU should focus.

The main points made during the wide ranging discussions are presented below under "topic" headings.

1. **Cyclone Warnings and Preparedness**

- Warnings must be credible, clear (understandable), and designed for the general population in the coastal areas.
- The present warning system was designed to meet maritime needs.
- Radio broadcasts in the Chittagong dialect may not be understandable to some people.
- People do not take warnings seriously because of the large number of "false warnings" (no severe impact).
- Inadequate co-operation between CPP personnel, Upazila and Union officers, and NGO personnel.
- Teachers and Imams should be involved; the mosque public address systems should be used.
- Warning and preparedness should be included in primary school curriculum.
- Greater participation of the population and their representatives is essential in preparedness and warning, not only in organising relief.
- Regular co-ordination meetings and reviews of the system are needed (National Co-ordination Committee has not met for 3 years).

2. **Flood Warnings and Preparedness**

- Not clear who disseminates the warnings issued by BWDB.
- Present warnings give only river heights at 16 locations. ("Danger Levels" correspond to the average flood level for unembanked rivers; 10cm below the design level where there are embankments.)

- BWDB hopes to develop models to predict actual areas likely to be flooded, but this is complex and will take a few years.
- A useful warning would be one that specifies that the water will be "x" feet deep at the school/mosque, for example.
- Need closer collaboration (information exchange) with India on water levels.
- BDRCS has project to develop, on pilot basis, an equivalent to the CPP for the flood-prone areas.
- Floods significantly different from cyclones in their impact; people generally make their own arrangements to move to roads or embankments; preparedness must be based on community mobilization and participation.

3. General Preparedness, Shelters, and Killas

- Preparedness should be integrated in local-level development plans and activities, as much as possible.
- Regular (annual?) practice drills should be held, and local-level preparedness plans be reviewed/refined as required.
- Emergency teams - civil administration, health/medical, and DPHE - should be formed/designated in advance.
- The Fire Service/Civil Defence, its volunteers, and the Ansars/VDPs should be fully involved/integrated into warning and preparedness arrangements.
- As many cyclone-proof buildings as possible are needed in the coastal areas; the agencies involved in building multipurpose structures should exchange information and ideas on designs.
- Overall co-ordination of the construction of shelters/ cyclone-proof buildings is essential; should be exercised by the Planning Commission? (MOR not involved...)
- Some killas have been constructed in flood-prone areas, but large numbers of killas throughout the flood plain would not be feasible, nor desirable (except in char areas?), in view of problems of land scarcity, acquisition and maintenance.
- Concentration should be on ensuring some raised land around schools, health centres, etc.; wide road embankments in strategic locations; the use of Idgah land.
- Need arrangements to ensure the maintenance of embankments, and to prevent unauthorized breaches.
- Registration of land occupied by small farmers is essential (lack of security of tenure is a major impediment to evacuation).
- Project must be informed of the killas, or other raised sites in their areas.
- Measures are needed to ensure security of property when people evacuate.

4. Standing Orders, Co-ordination, and Operational Management

- Existing Standing Orders are fairly comprehensive, but copies difficult to obtain, and no review has been carried out since they were issued.

- There is no reference to NGOs, volunteers, or community participation (especially in relation to pre-disaster activities); this should be corrected; the role of NGOs and volunteers, and the relations between them and the administration, should be defined.
- The Standing Orders should be reviewed regularly, including arrangements made pre-disaster.
- There may be a need to relax/adapt some of the normal administrative rules and procedures.
- Must specify arrangements for operational co-ordination at all levels, and information flows.
- The crucial role of the Union level representatives and Govt. employees must be fully recognized; appropriate authority and resources should be given.
- The Upazila level must be strengthened for pre-disaster, disaster, and post-disaster planning and implementation.

5. Communications, Transport and other Resources

- Must strengthen normal telecommunications facilities in high-risk areas.
- T&T should establish alternative routes, and more HF connections (needs investment); HF presently with Civil Administration, Police, BDRCS, Fire Service, Armed Forces.
- Must ensure the shared use of available facilities in any emergency.
- Police radio a vital resource, but gets over-loaded; need review of HF radio facilities of the civil administration and MOR.
- In other countries, the availability of two-way radios to private citizens and organizations proves valuable at times of disaster; the possibility of some liberalization of regulations in Bangladesh should be considered (while respecting security concerns).
- The Armed Forces provides very valuable support to the civil administration in transport; medical teams; provision of dry food; supervision of distributions. (Could more be done in relation to telecommunications?)
- BADC has mobilized large numbers of pumps for de-watering operations in the past; this capacity is now much reduced (following handing over to the private sector); similarly for fertilizer; may need to consider arrangements to ensure the availability of pumping capacity in inaccessible areas.
- DPHE able to mobilize staff and repair damaged/choked-up tubewells fairly quickly (several days), but people should be able/enabled to undertake repairs for themselves.
- DPHE sometimes faces problems in arranging transport for staff and to deliver spare parts. Mechanics and stocks of spare parts at union level in the disaster-prone areas would ensure rapid response.
- Measures should be taken to mobilize/motivate the private transport sector to respond to emergency needs (rather than profiteering).

6. **Training, Public Education**

- Specific training is needed for government officials, NGO personnel, and volunteers.
- Some NGOs have already developed some training courses, materials, and a manual, which could be shared with Government; joint training would help to promote working together.
- The Fire Service/Civil Defence can provide training in first aid and accident recovery; it offers training for volunteers but few come forward; incentives might be needed.
- Widespread public education essential, including through schools.

7. **Information management; Information to Donors and News Media**

- The computer-based information set up (by an NGO) for the Zonal Relief Co-ordinator in Chittagong following the 1991 cyclone proved very valuable; such systems must be used more widely to keep track of needs and inputs.
- Donors must be "managed", they must be given up-to-date information regularly concerning the assessed needs, what is now required, and what is not/no longer required.
- Similar information is wanted by the news media; frequent situation reports should be compiled and issued in a standard format, starting as early as possible; regular meetings should be convened.
- There must be a single focal point providing information to donors (in 1991 ERD and Foreign Affairs were issuing different information).
- The capacity must be developed within the Government to track needs and commitments, and prepare regular reports; this has had to be done by UNDP and World Bank in recent years.

List of Attendees

Name	Designation	Ministry/Department/Agency
Government and BDRCS		
M. A. Hakeem*	Secretary	Ministry of Relief
Prof. Dr.K.M.Fariduddin*	Member	Planning Commission
A.Z.M. Hossain Khan	Joint Secretary	Ministry of Relief
Motaher Hossain	Deputy Chief	Ministry of Relief
Brig.N.I. Laskar	Director General Fire Service & Civil Defence	Ministry of Home
Munir Uddin Ahmed	Addl. Chief Engineer	BADC
Lt.Col. Sadequl Islam	Director (Adm & Finance)	Dept. of Social Services Ministry of Social Wel.
Md. Manwar Ali	Director (M&O) T&T	Min. of P&T/T&T Board
Dr.Md. Aftabuddin Khan	Deputy Director	DG Health
Md. Zainal Abedin	Executive Engineer	Public Health Engineering
Nirmalendu Biswas	Assistant Director	Ansar and VDP
Emdad Hossain	Director	Cyclone Preparedness BRCS
A.S.M. Akram	Director	Disaster preparedness BRCS
Project Team (including counterparts)		
Martin Gillham	Team leader	Mott MacDonald
Syed Ahmed	Co-Team leader	House of Consultants
Ron Ockwell	Disaster Management Specialist	ADPC, Bangkok
Brian Ward	Director	ADPC/AIT
Faruq Aziz Khan	Specialist, Natural Resources	House of Consultants

Mark Brett	Coastal Engineer	Mott MacDonald
Amjad Hossain*	Agril. Specialist	House of Consultants
Alauddin Khan	Deputy Director	Dte. of Relief
Safiullah Bhuiyan	Dy. Director	Dte. of Relief
Motiur Rahman	Executive Engineer	LGEB
Professional Panel		
Md. Siddiquer Rahman	Former Cabinet Secretary	Institutional Adviser
Richard Holloway	Director	PACT/PRIP
UNDP		
C. Larsimont*	Resident Representative	UNDP
Kh. A. Hafiz	Assistant Res Rep	UNDP
Tomoatsu Kayano	Programme Officer	UNDP
Other		
G. Colombo*	Project Consultant	Italian Cooperation
Dr. V. Ragone*	Project Director	Italian Cooperation

* Attended for some, not all, of the sessions

ANNEX H

INITIAL REVIEW OF EMERGENCY CODES

ANNEX H

INITIAL REVIEW OF EXISTING STANDING ORDERS

H.1 General Observations

These notes refer to the English versions of the Standing Orders (or "Codes") issued by the Division/Ministry of Relief and Rehabilitation in 1984 (floods) and 1985 (cyclones).

Both Codes provide lists of responsibilities of a range of government ministries and divisions as they existed in 1984/5. Ministries/divisions are expected to establish their own internal Action Plans. Many entries are rather general, largely focused at the national level. A few (e.g. police, ansars) are more specific concerning functions at the local level. As an exception, the entry in the Cyclone Code concerning the Bangladesh Rifles presents their Action Plan, giving detail of action to be taken by local BDR units, but omits any reference to action at national level.

Both Codes specify the responsibilities of divisional commissioners, deputy commissioners, upazila parishads, and union council chairmen and members. Both also provide instructions (more-or-less the same) concerning the formation and operation of emergency relief camps, the stocking and administration of emergency relief goods. Only the Cyclone code specifies a role for the BDRCS, as well as the CPP.

Both Codes provide for co-ordination committees at national level:

- The Flood Code provides for a *Standing Central Co-ordination Committee for Flood Emergency* with a defined membership and responsibility "to assess flood damage, co-ordinate relief work, and provide policy guidelines for field work." It should meet "periodically during the flood season and in emergency meet as and when considered necessary by the chairman" (the Minister of Relief).

- The Cyclone Code provides for a *National Co-ordination Committee for Cyclone Emergency*-- composition to be defined by the President and notified in the official gazette. It should meet "as and when considered necessary by the chairman ... to review the overall preparedness measures and direct the concerned authorities." In the event of a cyclone disaster, the committee is to assess damage; co-ordinate, direct and oversee overall rescue relief and rehabilitation measures ... assess and allocate resources at national level ... review the implementation of the Standing Orders, etc.

Both Codes list, as one of the responsibilities of the DCs and UNOs, the formation of *district and upazila co-ordination committees.* Neither Code specifies the composition or functions of those committees in any detail:

- The Flood Code states only that, at district level, the DRRO will be a member "to meet [the DC's] requirements for rescue, relief and rehabilitation [in] case of a flood disaster." The wording is similar for the upazila-level committee.

- The Cyclone Code specifies that the district committee should comprise "representatives of concerned government ministries, divisions, departments, agencies, the BDRCS, CPP, and such other persons as [the DC] deems necessary." Upazila committees should include "all upazila-level officers and upazila parishad members, and officer of the CPP."

Both Codes distinguish (and list the responsibilities of the various bodies/individuals in relation to) a number of distinct "stages":

- The Flood Code recognizes 3 stages: *preparatory, disaster, post-disaster.* These are not defined/described but it appears that "preparatory" refers to the period when a potentially disastrous floods is known to be imminent, while "disaster" refers to the period of excessive inundation and, probably, a few days following the recession of the waters. "Post-disaster" appears to refer to the period when the emphasis is on rehabilitation.

- The Cyclone Code recognizes 5 stages: *pre-disaster, alert, warning, disaster, post-disaster.* These are said to be defined in relation to the warning signals for the maritime and river ports, as follows:

Pre-disaster	Off-cyclone season
Alert	Signals I-III
Warning	Signal IV (threat not sufficient to justify extreme precautionary measures)
Disaster	Signals V-X (severe weather expected)
Post-disaster	Immediately after the cyclone till normalcy is attained.

- "Disaster" and "post-disaster" therefore appear to be defined and used rather differently in the two Codes.

Regarding the responsibilities of the various bodies/individuals in relation to the different stages:

- The Flood Code specifies actions/responsibilities for each of the distinct stages for all but a few bodies (see 7 below).

- The Cyclone Code prescribes actions for the alert and warning stages separately only for the MOR, CPP, Radio Bangladesh, Bangladesh TV, Divisional Commissioners, DCs, Upazila parishads, Union chairmen, and BDRCS. For most other bodies, no distinction is made between the alert and warning stages. For the Ministry of Ports, Shipping and I.W.T., and the Energy Division, no pre-disaster responsibilities are identified. The entry foor the Ministry of Food includes a number of actions under a heading "pre-disaster stage", some of which (a to e) should clearly be placed under an "alert" heading. For the Ministries of Works and Social Welfare, no distinction is made between the alert/warning and disaster stages.

- In the Cyclone Code, the instructions addressed to DCs, upazila parishads, and union chairmen and members, appear to relate to the cyclone phases as defined in 5 above (with "disaster stage" referring to the last hours before impact). But the instructions addressed to ministries and other national bodies appear to reflect definitions of disaster and post-disaster corresponding roughly to those of the Flood Code (with "disaster stage" referring to the period of the impact and the immediate aftermath).

For a number of ministries -- Foreign Affairs, Finance, Education, Civil Aviation, Industries, Commerce, and Posts & Telecommunications! -- no specific standing orders had been established. The two Codes present only very general statements as to what their responsibilities should be, without any breakdown in terms of stages. The statements relate mostly to post-disaster rehabilitation.

Both Codes assign a central role to the Secretary of Relief who shall be "the superior executive officer" for emergency relief operations and, in that context, "exercise full/complete control over all civil officers." They also assign major responsibilities to the Divisional Commissioners -- responsibilities that clearly overlap with those defined for a number of the line ministries and for the Deputy Commissioners (DCs).

Both Codes refer to the *Control Room* in the Ministry of Relief (MOR/CR), but neither specifies the particular functions of that entity:

- The Flood Code calls for 11 ministries/divisions to "send" or "attach" a liaison officer to MOR/CR: for some, it is prescribed that this should be done during the preparatory stage, for others only at the disaster stage. The BDR and Police are to "earmark" liaison officers from the preparatory stage. The Army is to "earmark" a liaison officer for the MOR/CR at the preparatory stage, and send a Liaison Officer to report to the Central Co-ordination Committee for Flood (CCC) during the disaster stage. The Navy is to "liaise" with the MOR/CR and the CCC from the preparatory stage. The Air Force is to "keep in contact" with the MOR/CR. In several cases it is specified that reports on damage and other information are to be sent to the CCC.

- The Cyclone Code calls for 12 ministries/divisions, plus the Army, Navy, Air Force, and Police, to "designate liaison officers for contact with" MOR/CR from the alert stage or, in a few cases, the disaster stage. The Met. Dept is required to provide information to the MOR/CR, while the CPP is to keep the chairman of its Implementation Board (the Secretary of Relief) and the D-G/DR&R "informed of the situation."

Both Codes provide for the D-G/DR&R and many of the ministries/divisions to establish their own control rooms (CRs):

- The Flood Code envisages CRs being set up at the preparatory stage by D-G/R&R and the Ministry of Information. The ministries/divisions of Health, Food, Rail/Road, and Ports, plus the Army, Navy, and BDR, are all to set up CRs at the disaster stage. The Ministry of Irrigation is to operate a Flood Information Centre from May to November.

- The Cyclone Code envisages the same bodies, plus the Ministries of Works and Local Government, the Air Force, Police, and Ansars, establishing CRs at times of cyclones -- at the alert stage in most cases. In some cases it is specified that the CR is to be "established" at the alert stage, and "operated round the clock" during the disaster stage. The entry for the Ministry of irrigation states that the ministry will "establish and run the cyclone information centre in the BWDB which will serve as the control room. The centre will run from 1st May to 30th November."

Ministries/divisions for which standing orders have been elaborated, but which are not called on to establish their own control rooms (at national level), include: Agriculture, Livestock, Fisheries, Civil Aviation, Social Welfare, Rural Development, Fire/Civil Defence. As note in 7 above, no detailed standing orders are listed for several ministries/divisions, including Energy/PDB and Communications/T&T.

Both Codes specify (in appendices) the format (list of headings) for *Emergency Diaries* to be maintained by DCs, UNOs, and union council chairmen. The formats in the Flood and Cyclone Codes are very similar, but not quite the same:

- The Flood Code requires the union chairmen to "prepare and maintain emergency diary as required by higher authority." No reporting is specified as such. The UNO is required, during the disaster stage to "submit daily situation report, to include area affected, casualty, damage to property/crops and relief measures taken, to the CCC, all Ministries concerned, and the DC." The UNO is further required (during the post-disaster stage) to "arrange for supply and maintenance of emergency diary from upazila town to union level as in the proformas appended."

- The Cyclone Code requires the union chairmen to "undertake quick survey of the affected areas and report through special messenger to Chairman upazila parishad, with recommendation for relief" and, separately, to "prepare and maintain Emergency Diary in proforma as in appendix and submit damage report to the upazila control room." The Chairmen of the upazila parishads are required to "undertake quick survey of the affected areas and report to DC and the MOR" and, separately, to "collect cyclone reports union ..... and communicate daily reports to District Control Room."

- Although appendices present formats for use by DCs, no reference to the keeping of such diaries by DCs is made in the texts.

There are a number of errors in the final compilation and printing of the documents. In the Flood Code, for example: Danger Signals should be issued at least 17 hours before predicted landfall not 10 hours, paragraphs 84 and 85 should be reversed [p.34/5]; under Deputy Commissioner and Upazila Parishads, the references to "rescue and relief measures" and "receipt, issues and dispatch of relief items" should presumably be under the disaster stage rather than the preparatory stage. In the Cyclone Code, for example: under Ministry of Food, "alert" and "pre-disaster" measures are not distinguished [p.29]; the paragraphs numbered 169-172 should appear after 174, under the heading Divisional Commissioners.

The Cyclone Code specifies (in Annex A) 5 separate lists of addressees who particular levels of storm warnings are to be transmitted by the Met. Dept. It is not clear whether, for example, a warning corresponding to signal V should be transmitted only to address list "Hurricane" or also to address list "Whirlwind". Nor are the circumstances specified under which warnings should be transmitted to ... and .... respectively.

H.2 More Recent Instructions and Precedents

During the major floods in 1987 and 1988 (when the country was under martial law), and following the cyclone in 1991 (just after the transition to democratic government) arrangements were made, and Government orders issued, which were outside the provisions of the published Standing Orders. Measures included:

- The establishment of the President's Secretariat as the focal point for the overall direction and inter-ministerial co-ordination of relief operations in 1987/8, and of the Prime Minister's Office supported by the Cabinet office as focal point in 1991.

- The establishment of broad-based relief co-ordination committees at district and upazila levels.

- The sending of ministers and class I officers on deputation to the worst-affected areas (assigned at district, upazila, and even union levels).

- The assignment of two Zonal relief Co-ordinators, at Secretary level, with their own small staff units, in 1991.

The importance of the logistic and monitoring capabilities of the national and other armed forces in support of the civil authorities, has been amply demonstrated. The scale and importance of the inputs of NGOs has increased considerably, and the NGO Bureau has been established under the Prime Minister's Office.

H.3 Aspects Requiring Further Review of and Discussion

Based on this initial, incomplete review, the following can be identified as aspects requiring further detailed review and discussion with the concerned parties. The list is not exhaustive:

i) The relevance of the many small differences of provisions and language between the two Codes -- the extent to which it would be possible and appropriate to standardize between the two.

ii) The definitions of the different "stages", and in particular the apparent inconsistency in the use of "disaster stage" within and between the two Codes.

iii) The precise functions, inter-relationships, and lines of communication between the various co-ordination committees and control rooms.

iv) The arrangements and criteria for assessing damage and needs, and related reporting forms and procedures.

v) The existence, or otherwise, of Action Plans within each of the concerned ministries, divisions and agencies, and the compatibility between such Plans and the Standing Orders.

vi) The up-dating required as a result of restructuring of government bodies (e.g. creation of new ministries) and/or changes in government policy (e.g. privatization of certain functions).

vii) The role of the Divisional Commissioners.

viii) Responsibilities for preparedness planning and emergency response at district level and below following the abolition of the district councils, upazila and union parishads (and associated development committees).

ix) Confirmation that 'typhoon' messages are also to be sent to 'whirlwind' and 'hurricane' addressees and 'hurricane' messages also to "whirlwind" addressees.

x) Clarification of the definitions of "storm intensity" (in terms of wind speeds) corresponding to the various danger levels in the storm warning system:

xi) Clarification of the processes for notifying the bodies/officers on the various address lists ("whirlwind", "hurricane", etc.) of storm warning signals.

ANNEX I

INFORMATION TECHNOLOGY IN DISASTER MANAGEMENT

ANNEX I

INFORMATION TECHNOLOGY IN DISASTER MANAGEMENT
A PRELIMINARY REVIEW OF POSSIBILITIES

LIST OF CONTENTS

ANNEX I

INFORMATION TECHNOLOGY IN DISASTER MANAGEMENT

A PRELIMINARY REVIEW OF POSSIBILITIES

I.1 Overview

This Annex considers the possibilities for the technologies associated with computerized information as related to disaster management. The potentials of specific information technologies (e.g., Geographical Information Systems (GIS) and electronic bulletin boards) are presented in addition to details regarding information system applications to be developed during the course of this project. While developing some initial computer applications, the project will also give careful consideration to the significance, intention, interpretation and effectiveness of the contents of the various systems discussed below. This process involves exchange with a broad range of individuals, departments and organizations and entails an ongoing mechanism designed to be responsive to enable it to meet needs as they are related and understood.

Throughout the disaster management cycle from prevention and preparedness in anticipation, through operational coordination in the immediate aftermath of a disaster, to long term rehabilitation, there is a requirement for reliable information to support decision making. Computer technology with its ability to handle large volumes of data, coupled with its ability to link into communications systems, can play a vital role. This Annex outlines the various ways in which computers could be utilised and makes provisional proposals on the basis of a preliminary study. Selected applications are described in some detail and the necessary computer hardware and software specified.

I.2 Possible Applications

I.2.1 Introduction

The potential number of users of information is very large and would vary throughout the disaster cycle. Baseline data which describe the infrastructure before a disaster occurs should be available from a large number of sources and be made available to an even larger number of potential users. These users would come from Government, NGO and donor communities. Whilst some of these users might have computers, in which case the data might be given to them electronically, the majority would not in the immediate future and information would be made available in the form of printed reports and maps.

I.2.2 Preparedness

In normal times, before a disaster occurs, there is a need to identify, collect and collate basic information, and use it to assist with the formulation and testing of Contingency Action Plans. Accumulated data might also be analysed, for example, in mathematical models for predicting the extent and effects of storm surges.

The rapid assessment of relief and rehabilitation requirements following a disaster depends, to a large extent, on the availability of reliable, comprehensive information on the pre-disaster position. This baseline information might be seen as a directory of the people, infrastructure, and services. It is possible in collaboration with many other departments and agencies, to develop a framework of a Geographic Database of Bangladesh (GDB). Within the project period of ten months, it would not be possible to fully populate a framework with data nor to define all the possible parameters that might be included. However, a skeletal

framework or structure of information requirements can be developed. Most of the data identified as relevant to disaster planning and management could be geographically based, e.g. population centres, transport network, locations of government and NGO buildings and staff, shelters, hospitals, food warehouses, and the like.

Geographical Information Systems (GIS) software is designed to combine the traditional capabilities of databases, as used in most Management Information Systems (MIS), with mapping and spatially based data. The framework used in the GIS approach is the geography and administrative units (as identified by geocodes) of a region and it therefore accurately reflects the location and distribution of infrastructure etc. Flexibility to add new categories of information to a system is required.

A GIS system may be used in a variety of ways: to prepare specific maps and report tables; to make specific enquiries, e.g. 'where are the ferry ghats in Banshkhali Upazila?'; for analysis, e.g. 'show me the villages that are more than 1km from a shelter'; for scenario planning e.g. 'if a cyclone hits this area, how many people would be affected?'. To be truly successful, such a tool must be sufficiently flexible to allow ongoing development as it would not be possible to define all possible uses at the outset. However, the resulting system must not be made so complex that it becomes unwieldy and difficult to use. If a compromise is necessary, it would be far more important that a system be easy to use, rather than so powerful that it could only be used by highly trained computer specialists.

The present project will focus on identifying the most useful data for disaster managers and planners that can be visually displayed on maps or reported otherwise, and defining feasible ways of developing an appropriate GIS system, including the possibilities of collaboration with FAP.19 and other bodies with similar needs and long term capabilities. In many cases, the required data already exist within computer databases held by line Ministries and NGOs and some are already envisaging some form of GIS systems.

An important aspect of an eventual collaborative effort of this kind would be that the data compiled should be freely available to all those who contribute. Initially, this might be in the form of hard copy, in the longer term the entire resulting package, software and data, could be distributed. Using this approach, only sample data validation would be required to resolve conflicts. As a consequence, a GIS system would require simple input routines that would take data from different systems. Within the overall concept, there might be existing systems that adequately fulfill a requirement, once it is defined. It should be possible to incorporate these existing applications within the framework of the DB without having to rewrite software.

I.2.3 Damage Assessment

Following a disaster, the highest priority is to assess damage and needs, and hence identify and enable the correct relief and rehabilitation resources to be mobilised and allocated to the priority areas. An immediate need is for a simple tool which would allow consolidation of assessment data received from the district level (see 1.2.4 below). In the longer term it may be possible to envisage more sophisticated systems linked to a GIS-GDB as outlined above. Clearly, any assessment of damage must be related to conditions prior to the disaster. The data within a GIS-GDB system geared toward disaster planning and management would have the necessary structure to allow this relation, and a logical extension of these systems would be to provide the links, including assessment capabilities, of the data.

In such a larger, long-term context, the system would require the ability to handle large volumes of assessment data in very short periods of time: multi-user systems would be a prerequisite. The design of a GIS database should take this function into account. The database would, amongst other things, produce labelled maps for assessment purposes that would enable field teams to be able to clearly identify key components of the infrastructure that are damaged, e.g. bridges. This type of development could be undertaken during the course of FAP 11.

I.2.4 Co-ordination

The need to know 'what is required', 'where it is required' and 'what other people are doing' immediately after a disaster is very clear. It was a recurring theme in discussions with interested parties. Various tools might be envisaged for keeping track of needs and supplies during the disaster period.

Tracking and consolidating of the Donor contributions during a disaster would be required. This could be handled by a database in which the main relief items were categorised by Donor agency, by type and by value, and are consolidated and reported on a daily basis.

A complementary application would be to consolidate the Damage Assessment Reports sent in by the Deputy Commissioners. The forms currently used for such reports (the 'D' forms) are to be reviewed and improved to provide relevant information on overall damage and assessed needs. The system required to consolidate these reports would be significantly more complex than the system to handle the Donor pledges as there might be conflicting reports of damage and needs that would have to be resolved. As much of the data would be related to geography, the geocoding used in a GIS database could also be used for these data. A database GDB gazetteer function would facilitate data entry as the D forms sent would not necessarily be geocoded. It is envisaged that this system could provide daily summarised position reports.

The NGO PACT-Bangladesh has developed a computer-based system for tracking data from Donors and NGOs using a purpose-designed form. At present, this system is limited to NGO activities. Any system of this type cannot be developed in isolation from the forms used to collect the data. The work carried out by PACT should be used as an input to this project, initially relating to the design of the forms and subsequently to design of the software. Significant benefits in systems development, training, and information exchange would result if a common format could be used by both the GOB and the NGOs, or if there was a common approach to recording of data. In the subsequent stage, the question of whether existing programmes could be used as they are or with minor modifications should be considered.

One technique for distributing the consolidated information provided by the above systems could be facilitated by a computerised Bulletin Board. Such a system could initially be designed to help the headquarters staff of the agencies, based in Dhaka, to communicate with each other using computers and telephone communications. Such communications include organisation-to-organisation mail messages and public notice boards. They could have a significant use during normal times, allowing the different organisations in Dhaka to communicate with each other and with organisations such as UNDRO. In the long term, this kind of system could be extended over the whole of Bangladesh using technology such as satellite links, packet radio, and laptop computers, which would allow communication with the field immediately after a disaster.

I.2.5 Relief and Rehabilitation Services

Up-to-date information and analysis of 'who is doing what, where?' is required for operational planning and management and, later, to feed back into preparedness planning. This requires an analysis of the particular activities undertaken or planned, and the resources used, in order to generate an overview and also to provide the concerned organisations with an understanding of their part within the overall picture. Existing systems could be evaluated with a view to incorporating them into a DCMU databank, and used, or adopted, if appropriate. The DRIS system set up by PACT-PRIP for ADAB should be reviewed. It is based on questionnaires and the database covers the distribution and type of work carried out by the contributing agencies.

I.2.6 Disaster Logistics

There is a need for computer-aided logistical support in 'real time' during a disaster. The data would include where supplies were needed, where transport was located, where the supplies were, and the state of the transport network. Such computer systems are characterised by the need for multi-user access from remote sites, fault tolerance, fast responses, high volume processing and large data storage. Traditionally mainframe or mini computers have been used in such roles. The recent growth in the power of personal computers coupled with advances in networking technology puts these applications within the realm of technology that should soon be available within Bangladesh. It is not however within the resources of this project to design and implement such a system. However, the project would investigate the availability of packaged solutions. The objective would be to purchase an 'off the shelf' system which might then be tailored, if necessary, to meet local conditions during the course of the proposed FAP 11 : Comprehensive Disaster Preparedness Programme.

I.3 Applications Development

I.3.1 Introduction

As discussed, it would not be possible to fully develop all of the applications outlined above, while some of the applications could only be developed after baseline data had been identified and assembled. An example is the Disaster Logistics applications where the scheduling of trucks would be difficult without a knowledge of the status of road network. In consultation and collaboration with the various concerned organisations, the following applications are suggested:

- Assessment and needs analysis, based upon a much improved 'D' form
- Donor contributions
- Relief and Rehabilitation Services

In addition, attention will be given to the identification of basic elements of information that are useful to disaster planners and managers.

I.3.2 Geographic Database of Bangladesh

I.3.2.1 Introduction

This application could be the core tool for both preparedness planning and co-ordination of response to a disaster. It could be designed to provide easy access to the main data sets such as:

- population
- communications
- health
- food
- organisations (with focal point details)
- geography
- resources
- historical data

The power of the application would depend upon its being made readily accessible to non computer experts. For more specialist users, there would be considerable secondary benefits as the same data sets would be capable of analysis.

I.3.2.2 Existing GIS Systems

There is rapidly expanding interest in GIS systems within Dhaka. The following list, whilst not exhaustive, is a fair sample.

Project/Organisation	Primary System Software
FAP19	pcARC/INFO
BUET	pcARC/INFO
CITech	HyperCard
FAP4	pcARC/INFO
SPARRSO	pcARC/INFO
LGEB	pcARC/INFO
DDC/MPCS	pcARC/INFO
FAP6	SPANS
FAP25	pcARC/INFO
Dhaka Master Plan	pcARC/INFO

It is clear that pcARC/INFO is the predominant system. It is recommended that pcARC/INFO be used during this project to assess its capabilities for storing, producing and manipulating maps of potential use for disaster planning and management.

In the table above, it should be noted that CITech, with support from PACT-PRIP, have used Apple Macintosh computers with HyperCard software to develop a Disaster Management information system. The purpose of this system is similar to that of a database of information about Bangladesh usable for disaster related planning and management. After due consideration, it was decided not to recommend use of the Hyper Card system for disaster management purposes as it is not a true GIS system, would not accept dBase file data, and could not be used for analysis.

I.3.2.3 User Interface

Research has shown that graphical user interfaces (gui) typified by windows, pulldown menus, pointing with mice and clicking buttons, and true representations of finished documents on the screen, are easier to use. The Apple MacIntosh, which is noted for its ease of use, did much to popularise the gui. Recently, with the introduction of the latest releases of MicroSoft Windows, the gui has become firmly established on the IBM pc as well. MS Windows has now sold more than 10 million copies becoming the fastest selling program ever. It is recommended that MS Windows be the basic operating platform.

I.3.2.4 Architecture

pcARC/INFO is a powerful tool that is able to carry out the analysis required for the project but is relatively difficult to use. ESRI, the authors, have recognised this problem and have recently produced a new low cost tool called ARC/VIEW. This software is designed to be easy to use for querying and reporting on existing pcARC/INFO databases. It is not able to build up the databases or to modify the data. It runs on the industry standard MS Windows gui.

Within a GIS, the data has two types of attributes, firstly the spatial or geographic part, e.g. the coordinates of a road centre line, and secondly the tabular or non spatial data such as the road type and classification. pcARC/INFO stores the tabular data in dBase compatible data files. This allows existing dBase files to be manipulated directly by pcARC/INFO or vice versa. Both of these facilities could be useful for this project, the former because it is anticipated that there will be existing data within dBase files and the latter because there are many dBase skills in Bangladesh but relatively few pcARC/INFO skills.

Figure I.1 shows the data flow through the system.

I.3.2.5 Using the GDB

As has been stressed, a system of this type must be easy to use. The user would require little or no computer experience as the entire system would be graphically driven. The GDB could have the ability to zoom through the maps to a selected area, or alternatively the area might be accessed directly using geocodes, or place names via the GDB Gazetteer. The user might select different themes from a table of contents, e.g. shelters, population, land use. The relevant attributes could then be shown on the map. In the case of spatial data, e.g. population, it could be displayed as a filled area with the user able to customise the scaling via the legend. For point related data, symbols could be displayed which could be selected by the mouse to reveal tables of associated data. In addition, there could be an interactive query builder that allowed the combination of data attributes with logical operators such as 'and/or/etc.'

I.3.2.6 Hardware requirements

pcARC/INFO and to a lesser extent ARC/VIEW are computer intensive applications that require powerful hardware and large data storage. Fortunately, the price for computer hardware continues to fall. Typical units might be expected to cost approximately $5 000 each. In addition, various specialised input and output devices would be required, for input a digitising tablet, for output a high quality colour plotting device and a large format plotter.

I.3.2.7 Data requirements

A proposed list of fields is to be developed during this project. This will provide a starting point which would be refined during the initial phases of FAP.11. It is essential that the relationships between the core data types are fully understood before the database construction is started.

Infrastructure mapping is a key component of the GDB. The most detailed scale appropriate for planning is 1:50 000. Maps at this scale have been prepared from SPOT satellite images under the Multi Purpose Cyclone Shelter Study and these give much of the required detail. Work has also started on the production of maps giving details of infrastructure throughout the country by the Local Government Engineering Bureau. Further detailed review of the capacities and existing plans in various government agencies and exploration of the specific

instances in which this tool could be used at different levels to support disaster management will be made during this project. Information for consideration would include:

- physical boundaries; towns, villages, rivers, coastline, etc.
- administrative boundaries, district, upazila, etc.
- transport network, including bridges and other major structures
- GOB buildings; offices, godowns, shelters, hospitals, health complexes, schools, etc.
- Communications facilities, electricity distribution lines.

An important requirement would be to link the geocoding of the Bangladesh Bureau of Statistics with the cartesian co-ordinates of the mapping systems. This could be undertaken in conjunction with a gazetteer to store names, and multiple synonyms if required, for each geocode together with a digitised single seed point. The seed point would normally be stored at the approximate centre of the polygon described by the geocode.

I.3.2.8 Input Output

In addition to the standard routines supplied by the system software, part of a system should incorporate the development of simple input/output routines that would read standard format files. This might be seen as a 'translator'. In order to keep the number of translators to a minimum, it is recommended that comma separated values (CSV) be adopted as standard. In this way, data could be readily transferred between this system, existing systems and ad hoc analysis tools such as spreadsheets and graphing tools.

I.3.2.9 Users

A mappable database of Bangladesh (the GDB) would have an important role for disaster management both in 'peace' time and during a disaster. Its use would be much wider than the MOR/DCMU as it would provide a valuable data resource for line ministries to aid development planning by allowing them to relate their activities to above GOB infrastructure. Within the civil administration, the information could be used effectively down to Upazila level to help with disaster preparedness planning, and to provide a framework for reporting damage and needs. As Upazila administrations do not have the capability to run computer systems at present, information could be distributed in hard copy below the district level.

I.3.3 Assessment and Needs Analysis

As previously mentioned, this application should be closely linked with the forms to be used for the assessment of damage in the field. As these forms are under review, it is not possible to define the application in detail at present. The main outputs of the system would be regular reports during a disaster and a post disaster analysis report to facilitate rehabilitation work and subsequent preparedness planning.

The type of data that could be stored might include damage to:

- humans
- livestock
- crops
- housing
- infrastructure
  - bridges
  - roads

Figure 1.1
Software Architecture

airport, helipads, harbours
embankment
hospitals and health centres
schools
power lines
- water supply
- telecommunications

An essential feature of the system would be the linking of reports to geocodes. This would enable accurate geographic referencing of the reports and would also enable the data to be linked to the GDB. The use of the geocodes would enable the output reports to be consolidated by District. An important aspect of the use of geocodes would be to identify those Upazilas with which there had been no contact. An issue to consider would be whether the headings used in the analysis of the Donor contributions should be the same as those used within this system. If this was the case, it would be possible to develop an integrated approach to reporting on both contributions and needs.

The software recommended for this application would again be dBase.

I.3.4 Donor Contributions

The objective of this system would be to generate daily position statements during the relief and initial rehabilitation period based upon the information coming into the DCMU. In broad outline, this would monitor donor pledges under the following heads :

- Cash
- Food
- Health related
- Water
- Shelter (CI sheets, polythene, timber)
- Logistics (transport and communications)
- Miscellaneous (domestic utensils, clothing, etc.)

Under each head, key items sub-categories would be stored with any further items being aggregated into an 'other' category. For each item, both a number of units and a value would be stored together with details of the intended and actual delivery date and the delivery channel. On this basis, it would be possible to summarise contributions by donor or by category. In addition, the quantities of individual items and values could also be monitored.

The system would be developed using database software on a pc. Subject to a review of the existing system in the NGO sector (the PACT-PRIP : DRIS system) the software would be dBase. Selecting dBase would make maximum use of the locally available skills and would provide compatibility with the GDB.

Using data provided by UNDP for the 1991 cyclone a first cut data-base system has been developed to handle donor contributions (see Table I.1).

I.3.5 Relief and Rehabilitation Services

In a similar manner to the Assessment and Needs database referred to above, this database would store (and permit analysis and report generation) on a range of relevant activities, to be defined. The PACT-PRIP DRIS system, tailored to the perceived needs of NGOs, includes the activity categories detailed on Table I.2.

TABLE I.1

BGD/91/021 : ASSISTANCE TO MINISTRY OF RELIEF IN CYCLONE REHABILITATION
GOB & DONOR COMMITTMENT TO 1991 CYCLONE DAMAGE (US$ 1000)

Agencies	PM Relief Fund	Cash (unspecified)	Red Crescent	NGOs		Relief Materials		UN Agencies	Special Allocations	Unspecified	Total
				Foreign	Local	Value	No Value				
2 Bilateral Donors											
AUSTRALIA	25	0	0	1575	408	0		0	0	0	2008
BELGIUM	0	325	0	0	0	0		0	0	0	325
BHUTAN	0	100	0	0	0	0		0	0	0	100
BRUNEI	0	150	0	0	0	0		0	0	0	150
CANADA	0	0	0	4250	500	0		2609	0	0	7359
CHINA	0	0	48	0	0	2384		0	0	0	2432
DENMARK	0	0	1207	0	43	43		0	0	0	1293
EGYPT	0	0	0	0	0	1000	Heli,40 techs.	0	0	0	1000
FINLAND	0	0	0	0	0	0		85	0	525	610
FRANCE	0	0	0	700	600	7380		0	0	0	8680
GERMANY	0	0	247	4817	667	5000		0	20000	0	30731
INDIA	5150	0	800	0	100	0	Heli	0	0	0	6050
INDONESIA	0	0	0	0	0	100		0	0	0	100
IRAN	0	0	0	0	0	100		0	0	0	100
IRELAND	0	0	0	119	0	0		0	0	0	119
ITALY	0	0	0	0	0	900	Health kit	0	0	0	900
JAPAN	0	2000	0	0	520	0	Heli,40 techs.	0	7500	0	10020
LUXEMBERG	0	428	0	0	0	0		0	0	0	428
MALAYSIA	0	0	0	0	0	370		0	0	0	370
MYANMAR	0	0	0	0	0	150		0	0	0	150
NEPAL	0	200	0	0	0	0		0	0	0	200
NETHERLAND	0	0	0	0	0	0		0	0	9357	9357
NEW ZEALAN	0	29	0	0	0	0		0	0	0	29
NORWAY	0	438	0	84	0	4500		0	0	0	5022
PAKISTAN	3748	0	0	0	0	600		0	0	0	4348
PHILIPPINE	0	0	0	0	0	0	Medicine	0	0	0	0
SAUDI ARAB	0	0	0	0	0	0		0	106500	0	106500
SINGAPORE	0	0	0	0	0	25		0	0	0	25
SOUTH KORE	0	0	0	0	0	2110		0	0	0	2110
SPAIN	0	0	0	0	0	0		0	0	602	602
SRILANKA	0	250	0	0	0	0		0	0	0	250
SWEDEN	0	0	0	0	0	0		3000	0	3350	6350
SWITZERLAN	0	0	0	0	0	499	Various	0	0	0	499
THAILAND	0	80	0	0	0	1695	Heli	0	0	0	1775
UK	0	0	0	0	0	2393	Ship, Heli	0	9400	10011	21804
USA	0	25	0	3464	745	28539	Sea Angels	0	366	0	33139
Sub Total:	8,923	4,025	2,302	15,009	3,583	57,788		5,694	143,766	23,845	264,935
3 UN Agencies											
FAO	0	0	0	0	0	0		0	800	0	800
UNDP	0	50	0	0	0	0		0	1100	0	1150
UNDRO	0	50	0	0	0	1813		0	0	0	1863
UNICEF	0	0	0	0	0	2389		0	0	0	2389
WFP	0	0	0	0	0	4200		0	0	0	4200
WHO	0	0	0	0	0	210	Med. Teams	0	0	0	210
Sub Total:	0	100	0	0	0	8,612		0	1,900	0	10,612
4 Multilateral											
EEC	0	0	0	0	0	10000		0	0	2500	12500
SAARC	0	0	0	0	0	7500		0	0	0	7500
Sub Total:	0	0	0	0	0	17,500		0	0	2,500	20,000
RED CROSS	0	0	0	0	0	3523		0	0	0	3523
Sub Total:	0	0	0	0	0	3,523		0	0	0	3,523
Total	8,923	4,125	2,302	15,009	3,583	87,423		5,694	145,666	26,345	299,070

Source: UNDP Dhaka.

TABLE I.2
PACT-PRIP DRIS System Activity Categories

Relief Activity	Rehabilitation Activity
Preparing food	Building embankment/water control structure
Distributing food	Building village structure (roads/schools/clinics/shelters)
Distributing clothing/utensils	
Burial of dead	Organizing cash for work
Preparing/Distributing ORS	Organizing food for work
Distributing medicine	Organizing credit
Providing medical workers	Providing seeds
Providing transport	Providing other agricultural assistance
Distributing water/water purifying tablets	Rehabilitation / dewatering of ponds
Repairing/Providing water supply equipment	Disabled rehabilitation
Providing sanitary facilities (latrines)	Providing tools and equipment for self-employment
Caring for distressed (orphans, old, sick)	
Distributing emergency shelter materials	
Setting up and managing refugee camps	
Providing house re-building materials	
Managing house re-building	

Source: PACT-PRIP, 1992

It is envisaged that similar categories might be appropriate for the DCMU with the addition of others such as: telecommunications; land/river/air transport; other logistics inputs; public security.

I.3.6 Bulletin Board

A Bulletin Board is directly analogous to a conventional noticeboard but one which could be read remotely by using a computer and a modem. Unlike a conventional noticeboard, it is possible to arrange the notices into different topics and to make some of them public (available to all users) and some private, requiring a password to access. For most topics, it would be appropriate to allow users of the system to add their own contributions. Such systems have no practical limit to the number of topics that could be handled. If the Board is to be successful in the long term, all interested parties should be encouraged to establish their own topics. This would help promote co-ordination and communication in a general way.

During a disaster, the Bulletin Board could be used to give daily position reports and requests for assistance. Donor responses, movement of people and resources could all be indicated. Interested agencies would themselves enter the information they wish to share with others. In this way, the information would be self generating and the primary function of the DCMU, other than displaying its own information, would be regulation and administration. In a situation of free dissemination of information, the accuracy of information might be called into question. It would clearly not be possible to validate the information but the system would identify the contributor and in this way the source of all information would be ascribed.

Commercially available software to establish and run a Bulletin Board is available. The American NGO VITA has developed a Bulletin Board specifically for use during disaster situations called VITANET. It is available at a low cost and would have the added advantage of allowing access to a worldwide network of electronic mail users. Amongst the users of this network are UNDRO. The software requires a 386 computer and a modem to connect to a telephone line. If the system is to be set up to access the international community the telephone line must be international. The system should be set up and run 24 hours per day. Both the telephone line and the computer would be dedicated to the Bulletin Board should not be used for other purposes.

The effectiveness of a Bulletin Board is dependent on people concerned with disasters actually using it. In discussions with interested parties, it became clear that they could not say how useful they would find it until they had seen it in operation. Doubts were raised as to whether the telephone network could sustain the communications required. During the initial input of the MIS Specialist the use of modems for electronic mail was tested in Dhaka (linking to UK) and no difficulties were encountered. Hence, the use of the Bulletin Board should be further researched in FAP.11 to determine whether the technology is appropriate for use within Bangladesh.

I.4 Hardware and Software

Systems described above would be developed on IBM pc compatible computers. The computer hardware and software should enhance the capacity of the DCMU to develop systems and to fully participate in both the growth and the evolution of further applications. 486 machines with adequate storage capacities are necessary. It is proposed that three workstations be purchased all to the same basic specification enabling exchange in the event of failures. This is in addition to the two secretarial workstations and one laptop computer that have already

been purchased for the project.

Besides the computers, a laser printer for output and a digitiser allowing participation in mapping exercises would be required.

In addition to the speciality GIS software pc ARC/INFO and ARC/VIEW, standard word processing, spreadsheet and database software would be required. WordPerfect, Lotus 1-2-3 and dBase IV are recommended. The computers would be set up to run using MicroSoft Windows (v3.1) so that it would be necessary to buy the Windows version of 1-2-3 and WordPerfect, (the Windows version of dBase is not yet available). The software could be obtained from local agents in Bangladesh.

Table 1.3 lists the kind of equipment typically required for a GIS unit.

TABLE 1.3

Prototypical List of Requirements for a GIS Unit

Description	No	Estimated Unit Cost £	Estimated Unit Cost $	Total Cost $
Computer Hardware				
PC Workstation				
486 DX processor at 33MHz 100 Mb SCSI Hard disk 3.5" floppy disk ISA Bus 8Mb RAM 2 Serial, 2 parallel and mouse ports mouse colour SVGA display (16") MS DOS 5 and Window 3.1 1 Mb Video RAM	3	2500	4250	12750
Bulletin board pc				
306 dx processor 20MHZ 4Mb RAM 3 serial, 1 parallel, 1 mouse port 3.5 floppy disk Colour BGA display (14") 3 serial, 1 parallel, 1 mouse port MS DOS 5 and Windows 3.1 mouse	1	1000	1700	1700
Digitising tablet				
Summagraphics 1812	1	750	1275	1275
Laser printer				
HP Laser jet series III 4Mb RAM	1	2000	3400	3400
Colour in Jet				
HP Paint jet (New A3 model)	1	2000	3400	3400
AO Pen plotter				
Calcomp 1042 or equivalent	1	8000	13600	13600
Intelligent print buffer				
6 parallel inputs 2 parallel outputs 512kb memory 6 no parallel cables software selectable	1	500	850	850
Modom				
Hayes c24 bis MNP level 5 error correction	5	300	510	2550
Uninterruptable Power Supplies				
500VA	4	250	425	1700
Voltage Regulator and surge surp	1	100	170	170
Tape backup				
External unit 100Mb capacity SCSI Interface Backup software	1	600	1020	1020
Software				
PcARC/INFO				
Starter kit ARC/Edit ARC/Pilot				
ARC/Overlay	2	4650	7905	15810
ARC/View	3	750	1275	3825
WordPerfect for Windows	1	300	510	510
Lotus 1-2-3 for Windows	1	300	510	510
dBase IV developers edition	1	500	850	850
VITANET	1	500	850	850
QEMMv6	1	100	170	170
MicroGrafix Windows Draw	1	150	255	255
Threadz Organiser	1	150	255	255
Bangla Software	2	500	850	1700
	Sub-Total :			24735
	Grand Total :			67150

Exchange rate 1 £ = 1.70

Notes:

Prices are based on curent UK prices and are therefore only for estimating. Consumables: ink jet cartridges, laser toners, floopies, etc. are not included

ANNEX J

PERSONS MET

ANNEX J

AGENCIES AND PERSONNEL CONTACTED

The following list give details of the agencies contacted, and the personnel met,the date of the meeting and the initial of the project staff who attended. Notes have been prepared for all such meetings.

Date	Organisation	Name	Designation	Project Staff
27.2.1992	OXFAM	Pram Unia	Regional Manager	MPG
04.3.1992	ODA	Peter Burton	Head, Disaster Unit	MPG
		Josie Robinson	B'desh Desk Officer	MPG
		Stephen Hillier	B'desh Desk Officer	MPG
18.3.1992	Cambridge Architectural Research	Andrew Coburn	Director	MPG
22.3.1992	UNDP Dhaka	K A Hafiz	Asst.Resident Rep.	MPG
		T. Kayano	Project Officer	DNM
22.3.1992	Min. of Relief	Md Hussain Khan	Jt. Secretary	MPG
		Motabur Hussain	Dy Chief	MPG
22.3.1992	UNDP Dhaka	Winston Temple	Dy Res Rep	MPG
		K A Hafiz	Asst Res Rep	MPG
23.3.1992	UNDP Dhaka	Charles H Larismont	Resident Representative	MPG
		K A Hafiz	Asst Res Rep	MPG
23.3.1992	FPCO	Siddique	Chief Engineer	MPG
24.3.1992	Min of Relief	Abdul Hakim	Secretary a.i.	MPG
		Hossain Khan	Jt Secretary	MPG
		Winston Temple	Dy Res Rep UNDP	MPG
		K A Hafiz	Asst Res Rep UNDP	MPG
24.3.1992	PACT (PRIP)	Richard Holloway	Executive Director	MPG
25.3.92	FPCO	Team Leaders Eighth Monthly Meeting		MPG
25.3.1992	FPCO	Nurul Huda	Chairman	MPG
27.3.1992	LGEB	Q I Siddique	Engineering Adviser	MPG
28.3.1992	EPC	Zeaul Huq	Managing Director	MPG
29.3.1992	OALRD	Saidur Rahman	Consultant	MPG
29.3.1992	Multipurpose Shelter Project	Prof. J R Chowdhury	Team Leader	MPG
		Tanvir Mohammad	Journalist	MPG
04.4.1992	JIMD House, Comberton	JIMD	Consultant	MPG
		Hugh Brammer	Consultant	MPG
		Steve Jones	Consultant	MPG
08.4.1992	WMO Director of Hydrology & WR	Dr. John C Rodda	Director	MPG
08.4.1992	WMO Office of Chief TCP	Don Vickers	Consultant	MPG
		Abe	Chief	MPG
09.4.1992	IDNDR	R M Hamilton	Acting Director	MPG
09.4.1992	UNDRO	Maureen Lee	Information Officer	MPG
		Rosa Delgardo	UNIENET Operator	MPG

		Ola Almgren	Coordinator A/P Region	MPG
		Giles Whitcomb	Chief, Information Branch	MPG
		Marie-Jo Floret	Officer i/c MIS	MPG
18.4.1992	BWDB/WMO	J E Dent	CTA BGD/88/13	MPG
20.4.1992	BDPC	S A Kafi	Director	MPG
22.4.1992	MOR	Hussain Khan	Project Director BGD/91/021	MPG
25.4.1992	MOR	Hussain Khan	-"-	MPG
27.4.1992	EEC	Nick Robert	Disaster Coordinator	MPG
28.4.1992	BHC	Wayne Evans	2nd Sec Aid	MPG
		Ian McPherson	Fisheries Adviser	MPG
28.4.1992	USAID	S Ali Noor	Population Specialist	MPG
29.4.1992	SDC	Henri F Morand	First Secretary (Dev.)	MPG
29.4.1992	JICA	Takeshi Naruse	Deputy Res Rep	MPG
29.4.1992	FPCO	Team Leaders Ninth Monthly Meeting		MPG
30.4.1992	World Bank	Ross Wallace	Flood Plan Coordinator	MPG
30.4.1992	CIDA	Brian Proskurniak	First Secretary (Dev.)	MPG
30.4.1992	USAID	Dr Jose Garzon	Programme Officer (NGOs)	MPG
02.5.1992	ADB	Nurul Huda	Project Officer (Infr.)	MPG
		K H Talukdar	Project Officer (RD)	MPG
03.5.1992	BHC	Sylvia Islam	NGO Liaison Officer	MPG
03.5.1992	BHC	Wayne Evans	Second Sec. Aid	MPG
03.5.1992	Italian Development Cooperation	Dr Vincenzo Ragone	Italian Coop.Officer	MPG
03.5.1992	World Bank	Saeed Ahmed Raza	WR Adviser	MPG
04.5.1992	UNDP Dhaka	K A Hafiz	Asst Res Rep	MPG
04.5.1992	SIDA	Mats Svensson	Councellor DCO	MPG
		Bo Sundstrom	3rd Secretary (Dev.)	MPG
04.5.1992	German Embassy	Gerhard Thiedeman	1st Sec (Dev Coop)	MPG
05.5.1992	World Bank	Paul N Hubbard	Chief,Operations Unit	MPG
05.5.1992	Min of Relief	Hussain Khan	Project Director	MPG
05.5.1992	Australian HC	Dr Chris Kenna	1st Dec. Dev.Asst.	MPG
05.5.1992	OXFAM	Mark Goldring	OXFAM Country Rep.	MPG
		Saidur Rahman	NGO Consultant	MPG
06.5.1992	SR House	Siddiquer Rahman	Ex Cabinet Secretary	MPG
06.5.1992	FAP-14 Office	Dr. Mostafa Alam		MPG
		Dr. Shamsul Alam		MPG
		Dr. Suzanne Hanchett		MPG
		Dr. Keith Pitman	Team Leader	MPG
07.5.1992	Min of Health	Dr. Aftabuddin Khan	Dep.Dir. CDC	MPG

		Dr. Bipin K Verma	EPR Consultant	MPG
07.5.1992	ADAB	Karim	Director	MPG
		Khalid	Disaster Preparedness	MPG
		Saidur Rahman	NGO Consultant	
07.5.1992	FAP-4	R I Thiagarajah	Team Leader	MPG
09.5.1992	NIPSOM	Various Organisations involved in Banshkhali Disaster Preparedness and Response Project funded by Italy		MPG
10.5.1992	BRCS HQ	A S M Akram	Director DPP	MPG
		Emdad Hussain	Director CPP	MPG
10.5.1992	FAP-18 Finnmap	Heikki Perenius	Project Manager	MPG
10/11.5.92	UNDP Dhaka	K A Hafiz	Asst Res Rep	MPG
12.5.1992	Min of Relief	Md. Hussain Khan	Project Director	MPG
		K. A. Hafiz	Asst Res Rep	MPG
12.5.1992	WFP	Gaston Eyben	Dir of Ops	MPG
12.5.1992	FAP 7	Bjarna Mathieson	Team Leader	MPG
13.5.1992	Min. of Food	Mutiur Rahman	Jt. Secretary	MPG
13.5.1992	Bangladesh Met Department	M H Khan Chowdhury	Director	MPG
		Shajedur Rahman	Dy Director	MPG
14.5.1992	CARE	Earl Goodyear	CARE Rep.	MPG
		Saidur Rahman	NGO Coordinator	MPG
17.5.92	MOR	Hossain Khan	JS/PD	SLM, MPG
17.5.92	PACT PRIP	R Holloway	Director	SLM, MPG
17.5.92	PACT PRIP	R Holloway	Director	SLM, MPG
17.5.92	UNDP	Dhaka	K. A. Hafiz	ARRSLM,MPG
17.5.92	BRAC	F.H. Abed	Executive Director	Sr, MPG
17.5.92	CITech	G.Mohiuddin	Director	SLM, MPG
18.5.92	HOC	Dr.S.Huq	President	DNM, MPG
19.5.92	SPARRSO	Dr.MA Chowdhury	Director	SLM
19.5.92	UNICEF	Nurul Islam	Prog.Officer	SLM
19.5.92	DPHE	Amin UAhmed	CE	SLM, AR
19.5.92	FAP-25	J Rasmussen	TL	SLM
19.5.92	MOR DG	Hossain Khan	Ag.DG	DD,RR,
19.5.92	FPCO	Monthly Meeting	All Team Leaders	MPG
20.5.92	UNDP	K A Hafiz	Asst. RR	MPG
20.5.92	HOC	Dr.S.Huq	President	SA,FAK,AR

207

20.5.92	FAP-23	Dr. IC Tod	Consultant	TJ,ROC,MPG
20.5.92	MO Food	Motiur Rahman	JS	SLM
20.5.92	DDC	Dr.JRC	TL,MPCS	RO,SLM
20.5.92	LGEB	QI Siddique	EA	SKS,NN,MPG
20.5.92	MO Health	Dr.Aftabuddin	Director	SLM
21.5.92	SR Hse, Banani	Siddiquer R	IS	SA,MHKC, TJ,RO,MPG
21.5.92	FAP19	Tim Martin	TL	TW,AR,SLM
21.5.92	FAP4		R Thiagrajah	TLMP,RT, SLM, IS
22.5.92	CARE	E Goodyear	RR	SLM
22.5.92	MM RO	Wrap up meeting		TJ,RO,MPG
23.5.92	Various places			MPG, MLAB
23.5.92	HOC Office	Dr.S. Huq	President	FAK,MB, MPG
23.5.92	MPCS Office	Dr.JRC	Team Leader	MB, MPG
24.5.92	FPCO	Mr.Safi	Ag.CE	AR,GH, SA,RO, MLAB,MPG
24.5.92	UNDP Dhaka	K A Hafiz	ARR	MPG
24.5.92	MO/WDFC	F Hayat	Addl.Secy	AKA,KAH,SA
24.5.92	LGEB	P Bertilsson	CTA, ILO	SKS,SM, AR, MPG
24.5.92	DDC	Dr. Nishat	Consultant	MLAB
24.5.92	HOC	Faruk Azia	NR Consultant	MLAB
24.5.92	DG Food	Nurul Afser	Dy.Director	SLM,RO,AR
25.5.92	Mirzapur UZ	S. Zakaria	UNO	SO,SLM,RO AR
25.5.92	Tangail Dist.	S.Akramuzzaman	DC ADC(M),ADC(R)	SLM,RO,AR
25.5.92	RHD Office	Ataur Rahman	CE	MPG
25.5.92	LGEB	HQMonowar Chow.	SE(P)	MPG
26.5.92	UNICEF	Philip Wan	C,W&ES	MPG
26.5.92	Forest Dept.	A A Bhuiyan	Directoq	SA,NU,MLAB
26.5.92	WHO	Dr.Verma Dr.V.Ragone	EPR Officer Italcoop	SA,RO,
26.5.92	MPCS Program	Dr.JRC	Team Leader	NA
26.5.92	PACT	R Holloway	Director	SLM,MPG
26.5.92	UNDP Dhaka	K A Hafiz T. Kayano	ARR Programme Off.	SLM, MPG

26.5.92	Approtech	Amjad Hossain	MD	MPG
26.5.92	NGO Aff.Bureau	Shahidul Alam Mir MA Wahed Saidur Rahman	DG Director NGO Coordinator	MPG
27.5.92	FAO Project	Frans V d Ven	CTA	MPG
27.5.92	Kampsax	B Mathiesen		MLAB
27.5.92	World Bank	Dr R Islam	PO(Ind)	NA
27.5.92	World Bank	Dr. R Islam	PO(Ind)	MPG, NA
27.5.92	ERD	K M Ejazul Huq	Addl.Secy.	MPG
27.5.92	UNICEF	Cole Dodge	Director	RO
27.5.92	WFP	G Eyben M Jones	Director Project Officer	RO
27.5.92	MO Shipping	M A Malik	Secretary	SA,RO,MPG
27.5.92	MO Agricul.	K M Rabbani	Secretary	SA,RO,MPG
28.5.92	SR House	Siddiquer R	Inst.Specialist	MPG,MLAB
28.5.92	Sandwell Inc.	R McFarlane W Treygo		MLAB
28.5.92	Italcoop	Dr B Ragone	Coordinator	MPG,MLAB
28.5.92	MO Fisheries	Secy.Fisheries		SA,MPG, RO, MLAB
28.5.92	ICDDR,B	G Wright J Mortoza	 Computer Spec.	SA,RO
28.5.92	IIEDM	Dr.S Safiullah	Secy.Gen.	SA,RO
28.5.92	Met Dept.	M F Quayum	Dy Director	NA
28.5.92	SPARRSO	Dr A M Chow.	Director	NA
28.5.92	SR House	Siddiquer R	IS	MLAB,MPG
28.5.92 28.5.92	Italcoop MOLF BS	Dr B Ragone AZM Nasiruddin	Coordinator Secretary	MLAB,MPG SA,RO, MLAB,MPG
28.5.92	UNDP	K A Hafiz	ARR	MPG
30.5.92	Civ.Aviation	M Rahman N Amin	DD Comm. SCO	NA
30.5.92	Plann.Comm.	Mokammel Huq	Member	SA,RO,MPG
30.5.92	Met.Office	S M Noor	Asst Director	NA
31.5.92	MOR	Hossain Khan	JS/PD	NA,MPG
31.5.92	CARE	Earl Goodyear	Res. Rep.	RO
31.5.92	FAO	Frans v d Ven	CTA	RO
01.6.92	BWDB	M Razzaque	Chairman	SA,RO,MPG
01.6.92	BWDB	J Dent	CTA	SA,RO,MPG

01.6.92	UNDP Dhaka	K Hafiz	ARR	MPG
01.6.92	FAP-14	Rosana Akar and colleagues		RO
01.6.92		R Kay	CRMC	DNM,MPG
01.6.92	BWDB	J E Dent Deputy Dir.	CTA	S Ahmed NA
02.6.92	CD&FS	Brig.N I Laskar	DG	NA
02.6.92	PTT	S I Khan	Chairman T&T	SA,NA,RO, MPG
02.6.92	PACT(PRIP)	Graham Wright R Holloway	Consultant Director	PR, MPG
02.06.92	UNDP	K A Hafiz T Kayano	ARR, UNDP PO	MPG
02.06.92	ODA	Sylvia Islam Mark Goldring M. Khalid	 OXFAM ADAB ADAB	 MPG SA,RO
02.6.92	Fire Service	Brig.N.I.Laskar Civil Defence	DG + 3 Directors	SA,RO
02.6.92	BRCS Delegate	M Fortier	Chief Delegate	RO
03.6.92	BRCS CPP	Emdad Hossain	Director CPP	NA
03.6.92	UNICEF	M. Roodkowsky	CPO	RO, MPG
03.6.92	UNDP, Dhaka	K A Hafiz		ARRMPG
03.6.92	MOR	M A Hakim Hossain Khan	Secretary Jt.Secretary	RO, MPG
03.6.92	PACT PRIP	R Holloway	Director	SA, RO
03.6.92	INTERTECT	Fred Cuny R Hill	Consultant Associate	RO
04.6.92	Siddiquer R	Chairman, POS		MPG, RO
04.6.92	ADPC	Terry Jeggle	Coordinator	RO
04.6.92	FAP:26	I M Hirsolmen	Consultant	RO, MPG
04.6.92	CSC	M.Rahman Khan	MD	DNM,MPG
06.6.92	DAE	Dr. A. Rahman	DG	SA,RO,MPG
06.6.92	LGEB	Per Bertilsson	CTA	MLAB, MPG
06.6.92	MPCS Project	Prof S Islam Dr. K M Ahmed	Consultant Consultant	NA
06.6.92	MPCS Project	Dr. J R C	Team Leader i/c Mapping	MLAB, MPG
07.6.92	Halcrow	R Thiagarajah Gardener Paramanathan	Team Leader Coastal Engineer I&D Engineer	MLAB
07.6.92	Police Dept.	Azizul Huq	AIG	SA,RO,NA
07.6.92	T&T Board	Fazlur Rahman	Dir. Int.	NA

		M Ismail	Divisional Eng.	
08.6.92	BADC	M. A. Hashim	Member-Planning	RO
11.6.92	Grameen Bank	Dr. Md. Yunus	Managing Director	SA,RO
14.6.92	CARE/PACT	E. Goodyear R. Holloway	Director-Food Director	RO
15.6.92	British Council	M. Ward		RO
16.6.92	WFP	Yunus Khan	Training Officer	RO