Government of the People's Republic of Bangladesh

National Plan for Disaster Management

2010-2015

Disaster Management Bureau
Disaster Management and Relief Division
Ministry of Food and Disaster Management

Government of the People's Republic of Bangladesh

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Disaster Management Bureau
Disaster Management & Relief Division

April 2010

بسم الله الرحمن الرحيم

Message

I am happy to learn that the National Plan for Disaster Management 2010-2015 has been prepared aiming at reducing vulnerability of the poor to natural, environmental and human-induced disaster to a manageable and acceptable level.

The plan has been developed in line with the government mission taking into consideration the Hyogo Framework for Action 2005-2015 and adopting the SAARC Framework on disaster management.

Bangladesh, a highly disaster-prone country, suffers a lot almost every year from various natural disasters. It is the responsibility of the state and government to protect people through managing disasters in a holistic manner engaging the entire government machinery.

The government is very sincere in mitigating the sufferings of the people reducing losses due to any disaster.

I urge the Disaster Management Bureau and Disaster Management and Relief Division to facilitate all types of support for proper implementation of the plan.

I hope that implementation of the National Plan for Disaster Management 2010-2015 will reduce people's misery and ensure their wellbeing.

Joi Bangla, Joi Bangabandhu
May Bangladesh Live Forever

Sheikh Hasina

FOREWORD

The National Plan for Disaster Management 2010-2015 is an outcome of the national and international commitments of the Government of Bangladesh (GoB) and the Disaster Management and Relief Division (DM&RD) for addressing the disaster risks comprehensively. The plan has been developed on the basis of the GoB Vision and MoFDM mission to reduce the vulnerability of the poor to the effects of natural, environmental and human induced hazards to a manageable and acceptable humanitarian level by (a) bringing a paradigm shift in disaster management from conventional response and relief practice to a more comprehensive risk reduction culture and (b) Strengthening the capacity of the Bangladesh disaster management system in improving the response and recovery management at all levels.

Bangladesh has taken a holistic approach towards disaster management, where emphasis has been given to working together with all stakeholders to build strategic, scientific and implementation partnerships with all relevant government departments and agencies, other key non-government players including NGOs, academic and technical institutions, the private sector and donors. The role of Government is mainly to ensure that risk reduction and comprehensive disaster management is a focus of national policy and programmes.

The National Plan for Disaster Management is indicative to what the relevant regional and sectoral plans would consider to address the key issues like risk reduction, capacity building, climate change adaptation, livelihood security, gender mainstreaming, community empowerment and response and recovery management. The plan also will act as basic guideline for all relevant agencies in strengthening better working relations and enhancing mutual cooperation.

The plan reflects the country's initiatives since the creation of the Disaster Management Bureau in 1993 in line with the paradigm shift in disaster management from conventional response and relief to a more comprehensive risk reduction culture having the development linkages. Inclusion of Policy Matrix on Comprehensive Disaster Management towards poverty reduction and growth in Poverty Reduction Strategy (PRS) is an indicator of mainstreaming risk reduction and consideration of disaster-development linkages.

The Government of Bangladesh is committed to the implementation of its global and national commitment for establishing risk reduction framework. Execution of Standing Orders on Disaster, drafting of the Disaster Management Act, developing of the National Disaster Management Policy, launching of the MoFDM Corporate Plan, developing the Bangladesh Disaster Management Model, establishing the Disaster Management Information Centre (DMIC) and developing the National Plan for Disaster Management are the major milestones in the long run of our achievements.

The strategic goals of the Plan are drawn from the SAARC Disaster Management Framework. These goals are well linked to the international and national drivers, so that the plan can articulate the long-term strategic focus of disaster management in Bangladesh. We hope that the plan will contribute towards the formulation of a road map for the development of strategic and operational plan by various entities.

I would like to congratulate the DM&RD and DMB officials and CDMP professionals for developing this National Plan for Disaster Management, which will contribute to achieving the Millennium Development Goals (MDGs) and sustainable development of the country.

25/07/10

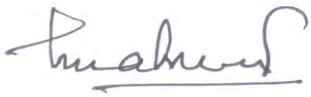
Dr. Muhammad Abdur Razzaque, MP

ACKNOWLEDGEMENT

The Disaster Management and Relief Division is very pleased to launch the National Plan for Disaster Management, to be implemented from 2010-2015. The Plan is the reflection of the commitments of the Government of Bangladesh for addressing disasters in a comprehensive way. The Plan will be helpful for effective intervention by the DM&RD to fulfill its mandatory role of coordinating all disaster management activities within the country. We hope that the plan will contribute towards a cohesive and well-coordinated programming framework, incorporating GoB, non-government organizations and the private sector.

In this regard, I offer my sincere thanks to the officials of relevant ministries and their agencies, NGOs, members of the disaster management committees, FPMU and other stakeholders for offering their views, comments and recommendations in developing the plan. I also extend my thanks to the officials of Disaster Management and Relief Division, Disaster Management Bureau (DMB) and Comprehensive Disaster Management Programme (CDMP) for developing and reviewing the plan through the lenses of climate change and making the plan climate change sensitive.

We are most grateful to Dr. Muhammed Abdur Razzaque, Hon'ble Minister for Food and Disaster Management for his kind guidance in developing this plan. We also take this opportunity to put on record our deep appreciation for the excellent cooperation from our development partners and well wishers for their support in preparing the document.



Md. Mokhlesur Rahman
Secretary
Disaster Management and Relief Division
Ministry of Food and Disaster Management

Preface

The National Plan for Disaster Management for 2010-2015 is a long desired document based on the global and regional commitment of the Government of Bangladesh and its vision on disaster management. The plan reflects the basic principles of the SAARC Framework on Disaster Management.

We all are aware of the specific programmes of Disaster Management Bureau to minimize the disaster risk at the community level and country as well. The DMB, with the proper guideline of the Ministry of Food & Disaster Management, already introduced the Standing Orders on Disaster in 1997, which is now active as a main instrument of comprehensive Disaster Management of the country. The Bureau is now also engaged in a process to develop the National Disaster Management Act, improvement of the cyclone signaling system, revision of Standing Orders on Disaster, procuring modern and sophisticated search and rescue equipment, needs and damage assessment report on Flood 2007 and Cyclone SIDR 2007 and other related workshops as well as its proper implementation to face the challenges of the disaster. It is a matter of great pride that before the introduction of the Hyogo Framework for Action, Millennium Development Goals and the United Nations Framework Convention on Climate Change, Bangladesh has introduced its own comprehensive Disaster Management Programme for mainstreaming disaster management in development plans and programmes. The CPP activities and disaster management programme activities are acclaimed by the world community and is perceived to be a pioneer one. It indicates the commitment of the Government to introduce an all hazards, all risks mitigation approach under a well established institutional framework.

The key focus of the National Plan for Disaster Management is to establish institutional accountability in preparing and implementing disaster management plans at different levels of the country. Development Plans incorporating Disaster Risk Reduction and Hazard Specific Multi-Sectoral Plans have made this plan an exclusive tool for reducing risk and achieving sustainable development.

Traditionally we are used to managing the natural hazards, but the need for addressing emerging issues like climate change adaptation, drought, desertification and human induced hazards in national policies and plans was urgently required. For the first time, a national document on disaster management has included both natural and human induced hazards in its action plan, involving government and non-government organizations, and the private sector in a comprehensive way.

The plan has been prepared in a participatory way, having several consultations with stakeholders and established a road map of effective partnership with the organizations working at local, national and regional levels. It is expected that this plan will contribute towards developing and strengthening regional and national networks.

I would like to acknowledge the guidance and suggestions from the Secretary of the Disaster Management and Relief Division in improving this national plan. We are also grateful to the Honourable Members of the Inter-Ministerial Disaster Management Coordination Committee for their views and recommendations.

I would like to express my sincere gratitude to my colleagues in Disaster Management and Relief Division (DM&RD), DMB and CDMP who have contribute towards developing the plan. I particularly offer special thanks to officials of Disaster Management Bureau (DMB), in particular Mr. AHM Abdullah, director and Mr. Probir Kumar Das, programmer of DMB and Dr. Aslam Alam, Dr. Shantana Rani Halder and Mr. Abu Mostafa Kamal Uddin of CDMP for their special efforts in preparing the planI also extend my thanks to our development partners, including the NGOs, for their cordial support in enriching this document.

Ahsan Zakir
Director General
Disaster Management Bureau

LIST OF ABBREVIATIONS

ADB	Asian Development Bank
ADPC	Asian Disaster Preparedness Centre
ADRC	Asian Disaster Reduction Centre
AFD	Armed Forces Division
APD	Academy for Planning and Development
ASEAN	Association of South East Asian Nations
BARD	Bangladesh Academy for Rural Development
BBS	Bangladesh Bureau of Statistics
BCAS	Bangladesh Centre for Advanced Studies
BCS	Bangladesh Civil Service
BDRCS	Bangladesh Red Crescent Society
BFS&CD	Bangladesh Fire Service and Civil Defence
BGD	Bangladesh
BGS	British Geological Survey
BMD	Bangladesh Meteorological Department
BNBC	Bangladesh National Building Code
BNDV	Bangladesh National Disaster Volunteers
BPATC	Bangladesh Public Administration Training Centre
BS	Bangladesh Scouts
BUET	Bangladesh University of Engineering and Technology
BWDB	Bangladesh Water Development Board
CBO	Community Based Organization
CCC	Climate Change Cell
CCDMC	City Corporation Disaster Management Committee
CDMP	Comprehensive Disaster Management Programme
CEGIS	Centre for Environmental and Geographical Information Services
CPP	Cyclone Preparedness Program
CPPIB	Cyclone Preparedness Program Implementation Board
CRA	Community Risk Assessment
CSDDWS	Committee for Speedy Dissemination of Disaster Related Warning/ Signals
DAE	Directorate of Agricultural Extension
DC	Deputy Commissioner
DDMC	District Disaster Management Committee
DDMP	District Disaster Management Plan
DESA	Dhaka Electric Supply Authority
DFID	Department for International Development
DGOF	Director General of Food
DIRA	Disaster Impact and Risk Assessment
DMB	Disaster Management Bureau
DMC	Disaster Management Committee
DMIC	Disaster Management Information Centre
DMTATF	Disaster Management Training and Public Awareness Building Taskforce
DoE	Department of Environment
DPHE	Department of Public Health Engineering
DM&RD	Disaster Management & Relief Division
DRR	Directorate of Relief and Rehabilitation
DRRO	District Relief and Rehabilitation Officer
ECNEC	Executive Committee of the National Economic Council
EIA	Environmental Impact Assessment

EOC	Emergency Operation Centre
FBCCI	Federation of Bangladesh Chamber of Commerce and Industries
FFE	Food for Education
FFW	Food for Works
FFWC	Flood Forecasting and Warning Centre
FPMU	Food Planning and Monitoring Unit
FPOCG	Focal Point Operation Coordination Group
GDACS	Global Disaster Alert and Coordination System
GDP	Gross Domestic Product
GIS	Geographical Information System
GOB	Government of Bangladesh
GSB	Geological Survey of Bangladesh
HFA	Hyogo Framework for Action
HIPC	Heavily Indebted Poor Countries
HIV/AIDS	Human Immune Virus/Acquired Immune Deficiency Syndrome
ICT	Information Communication Technology
IFRC	International Federation of Red Cross
IMDMCC	Inter-Ministerial Disaster Management Co-ordination Committee
IMF	International Monetary Fund
INSARAG	International Search and Rescue Advisory Group
ISDR	International Strategy for Disaster Reduction
IWM	Institute of Water Management
JPOI	Johannesburg plan of Implementation
LGD	Local Government Division
LGED	Local Government Engineering Department
LGRD	Local Government and Rural Development
LRP	Land Reclamation Programme
MDGs	Millennium Development Goals
MES	Meghna Estuary Study
MoD	Ministry of Defence
MoEd	Ministry of Education
MoEF	Ministry of Environment and Forest
MoFA	Ministry of Foreign Affairs
MoFDM	Ministry of Food and Disaster Management
MoF&L	Ministry of Fisheries and Livestock
MoH&FP	Ministry of Health and Family Planning
MoHA	Ministry of Home affairs
MoP&T	Ministry of Post and Tele-communication
MoPME	Ministry of Primary and Mass Education
MoRA	Ministry of Religious Affairs
MoS&T	Ministry of Science and Technology
MoW&CA	Ministry of Women and Children Affairs
MoWR	Ministry of Water Resources
MPO	Master Plan Organisation
MSL	Mean Sea Level
NAEM	National Academy for Educational Management
NDMAC	National Disaster Management Advisory Committee
NDMC	National Disaster Management Council
NDMTI	National Disaster Management Training Institute
NEC	National Economic Council
NGO	Non Governmental Organization
NGOCC	NGO Coordination Committee on Disaster Management
NWMP	National Water Management Plan

NWRD	National Water Resources Database
PCP	Project Concept Paper
PDMC	Pourashava Disaster Management Committee
PDMP	Pourashava Disaster Management Plan
PIO	Project Implementation Officer
POA	Plan of Action
PP	Project Proforma
PPRR	Prevention, Preparedness, Response and Recovery
PRSP	Poverty Reduction Strategy Paper
PWD	Public Works Department
RAJUK	Rajdhani Unnayan Katripakhaya
RCC	Regional Consultative Committee
RDA	Rural Development Academy
RRAP	Risk Reduction Action Plan
SAARC	South Asian Association for Regional Cooperation
SARDI	Soil and Agricultural Research and Development Institute
SDMC	SAARC Disaster Management Centre
SFA	SAARC Framework for Action
SMRC	SAARC Meteorological Research Centre
SOD	Standing Orders on Disaster
SPARRSO	Space Research and Remote Sensing Organisation
TAP	Technical Assistance Project
TAPP	Technical Assistance Project Proforma
TOT	Training of Trainers
TR	Test Relief
UDMC	Union Disaster Management Committee
UDMP	Union Disaster Management Plan
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
UNISDR	United Nations International Strategy for Disaster Reduction
UNO	Upazila Nirbahi Officer
UZDMC	Upazila Disaster Management Committee
UZDMP	Upazila Disaster Management Plan
VDP	Village Defence Police
VGD	Vulnerable Group Development
WARPO	Water Resources Planning Organization
WASA	Water and Sewerage Authority
WB	World Bank
WFP	World Food Programme
WHO	World Health Organization
WSSD	World Summit on Sustainable Development

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BACKGROUND

The government acknowledges the need for pre-disaster mitigation and preparedness of the people, as opposed to the earlier concepts of responding after a disaster has taken place, as a necessary as well as a cost-effective approach. Thus, priority has been accorded to focus on community level preparedness, response, recovery and rehabilitation. Programmes to train people living in disaster-prone areas, improving their capability to cope with natural disaster are highlighted. The Draft National Policy on Disaster Management has emphasized a group of broad-based strategies:

1. Disaster management would involve the management of both risks and consequences of disasters that would include prevention emergency response and post-disaster recovery.

2. Community involvement for preparedness programmes for protecting lives and properties would be a major focus. Involvement of local government bodies would be and essential part of the strategy. Self-reliance should be the key for preparedness, response and recovery.

3. Non-structural mitigation measures such as community disaster preparedness training advocacy and public awareness must be given a high priority; this would require an integration of structural mitigation with non-structural measures.

DISASTER MANAGEMENT VISION

The Disaster Management Vision of the Government of Bangladesh is to reduce the risk of people, especially the poor and the disadvantaged, from the effects of natural, environmental and human induced hazards, to a manageable and acceptable humanitarian level, and to have in place an efficient emergency response system capable of handling large scale disasters.

1. INTRODUCTION

Bangladesh is a low-lying deltaic country in South Asia formed by the Ganges, the Brahmaputra and the Meghna rivers. It is a land of about 136.7 million (SVRS, 2004, BBS) people within its 147,570 sq. km (Agriculture Statistics WinWing, BBS 2004-2005) territory. More than 310 rivers and tributaries have made this country a land of rivers.

Diversified cultural heritage, archaeological sites and the natural beauty of the country have made this land attractive. The country has the world's longest unbroken sandy beach of 120km, sloping gently down to the blue waters of the Bay of Bengal.

Around 52% percent of the civilian labor force of the country is engaged in agriculture and 14% is engaged in industry. Per capita GDP for 2002-2003 was US$418 (BBS, 2006).

Since independence in 1971, Bangladesh has achieved substantial improvements in some social indicators like a decrease in infant and maternal mortality as well as illiteracy, and an increase in life expectancy, access to safe water and sanitation. However, approximately 40% (HIES, BBS, 2005) of the population still continue to live below the poverty line (BBS, 2005). The economic performance of the country has been relatively strong since 1990, with an annual 5% average GDP growth rate. Although half of the GDP is generated through the service sector, nearly two thirds of Bangladeshis are employed in the agriculture sector with paddy as the single most important product.

The geographical location, land characteristics, multiplicity of rivers and the monsoon climate render Bangladesh highly vulnerable to natural hazards. The coastal morphology of Bangladesh influences the impact of natural hazards on the area. Especially in the south western area, natural hazards increase the vulnerability of the coastal dwellers and slow down the process of social and economic development. Significant country features include:

- A vast network of rivers and channels
- An enormous discharge of water heavily laden with sediments
- A large number of islands in between the channels
- A shallow northern Bay of Bengal and funneling to the coastal area of Bangladesh
- Strong tidal and wind action

Natural and human induced hazards such as floods, cyclones, droughts, tidal surges, tornadoes, earthquakes, river erosion, fire, infrastructure collapse, high arsenic contents of ground water, water logging, water and soil salinity, epidemic, and various forms of pollution are frequent occurrences.

Climate change adds a new dimension to community risk and vulnerability. Although the magnitude of these changes may appear to be small, they could substantially increase the frequency and intensity of existing climatic events (floods, droughts, cyclones etc). Current indications are that not only will floods and cyclones become more severe, they will also start to occur outside of their "established seasons". Events, such as drought, may not have previously occurred in some areas and may now be experienced.

SCOPE OF THE PLAN

a) Analyze the natural and man-made disaster threats including climate change to their people and society, economy and infrastructure, with a view to identifying where and when these threats are likely to occur and in what frequency.

b) Identify by further detailed analysis who and what are vulnerable to the occurrence of these threats and how these are likely to be affected by them.

c) Investigate what measures are possible to prevent occurrence of the disaster events, (unlikely to be possible in the case of the natural phenomenon but possible in the case of man-made disasters and environmental degradation), what can be done to mitigate the affects of disaster events and what disaster preparedness measures can be put in place in anticipation of these.

d) Determine where responsibilities for prevention, mitigation and preparedness planning and action should lie in the Government, non-government organizations (NGOs) and the private sector.

e) Make provision in the national budget for funding of activities related to Disaster Reduction and a contingency fund to meet the immediate needs of disaster relief, at all administrative levels of the Administration.

f) Ensure that the costs of disaster relief and post-disaster recovery are managed and coordinated by a high level committee to avoid duplication or waste across the spectrum of donor agencies, including government, national and international NGOs and the private sector.

g) Ensure an effective system within Government to link and coordinate the processes of planning and the management of sustainable development, environmental management and disaster reduction.

RESPONSIBILITIES AND STRUCTURE

The initial responsibility falling on governments is to make a clear statement of Government policy and strategy for the attainment of Sustainable Development, linked with Environmental Management and effective Disaster Reduction. It is of equal importance to ensure where responsibility for coordination and implementation of these policies and strategies lies, and that this is clearly stated, understood and accepted, with clear channels of communication and management laid down. The usual pattern in government organization and structure is that at the centre, responsibility for these various subjects is vested in several different ministries. Consequentially, their funding lies in various but uncoordinated budgets. The situation can become even more confusing if responsibility for Disaster Reduction falls under the Ministry or, more probably the department, which is responsible for disaster relief but not for disaster rehabilitation and recovery. Research and experience also shows that whereas in functional departments (e.g. transport, public works, agriculture, health etc), communication from the centre to the lowest administrative levels works well, inter-ministerial and inter-departmental communication and coordination at the central level does not.

2. HAZARDS IN BANGLADESH[1]

Bangladesh is exposed to natural hazards, such as, floods, river erosion, cyclones, droughts, tornadoes, cold waves, earthquakes, drainage congestion/water logging, arsenic contamination, salinity intrusion etc. But the nature of such occurrences, the seasons and extent of effects of the hazards are not the same in all places. Figure 1 presents Bangladesh Topography.

2.1 FLOODS

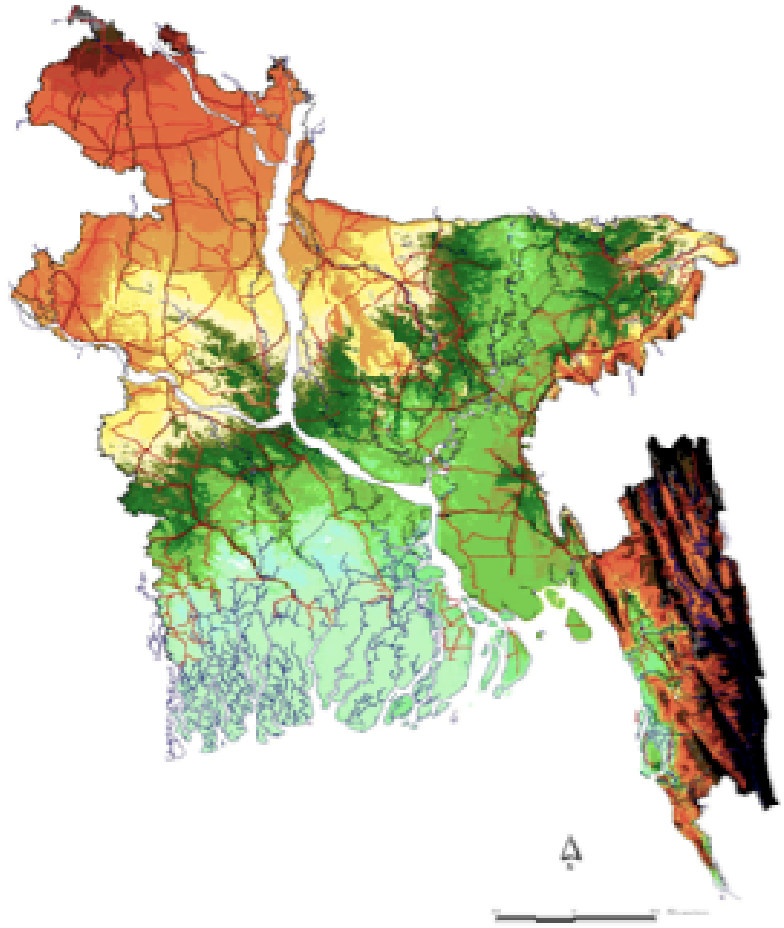
Floods are an annual phenomena, with the most severe occurring during the months of July and August. Regular river floods affect 20% of the country, increasing up to 68% in extreme years. The floods of 1988, 1998 and 2004 were particularly catastrophic, resulting in large-scale destruction and loss of lives.

Approximately 37%, 43%, 52% and 68% of the country is inundated with floods of return periods of 10, 20, 50 and 100 years respectively (MPO, 1986). Four types of flooding occur in Bangladesh (Figure 2).

- Flash floods caused by overflowing of hilly rivers in eastern and northern Bangladesh (in April-May and September-November).
- Rain floods caused by drainage congestion and heavy rains.
- Monsoon floods caused by major rivers usually in the monsoon (during June-September).
- Coastal floods caused by storm surges.

[1] Prepared by CEGIS for CDMP under the study on "Inventory of Community Risk Reduction Programme" November 2006

Figure 1: Topography of Bangladesh



- About 50% of the country is within 6-7m of MSL.
- About 68% of the country is vulnerable to floods.
- 25%-30% of the area is inundated during normal floods.

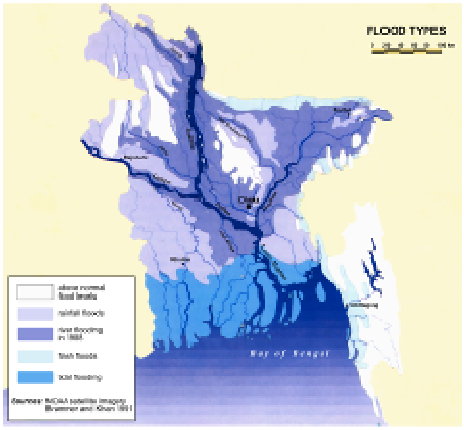
Legend:

International Boundary
River
Railway
Roads

Elevation in meter (PWD)

< 1 m	5 - 6 m	10 - 12 m	40 - 50 m	90 - 100 m
1 - 2 m	6 - 7 m	12 - 15 m	50 - 60 m	> 100 m
2 - 3 m	7 - 8 m	15 - 20 m	60 - 70 m	No Data
3 - 4 m	8 - 9 m	20 - 30 m	70 - 80 m	
4 - 5 m	9 - 10 m	30 - 40 m	80 - 90 m	

Figure 2: Types of Flooding



Types of flood:
- Monsoon flood
- Flash flood
- Rain flood
- Flood due to storm surges and tids

Flood differ in:
- Location
- Timing
- Intensity
- Duration

Figures 3 and 4 show the percentage of the total flood affected areas of the country for some selected years. The 1988 flood affected about two-third area of the country. The 1998 flood alone caused 1,100 deaths, rendered 30 million people homeless, damaged 500,000 homes and caused heavy loss to infrastructure. The 1998 flood lasted for 65 days from July 12 to September 14 and affected about 67% area of the country. This devastating flood had an enormous impact on the national economy, in addition to causing hardships for people, and disrupting livelihood systems in urban and rural areas.

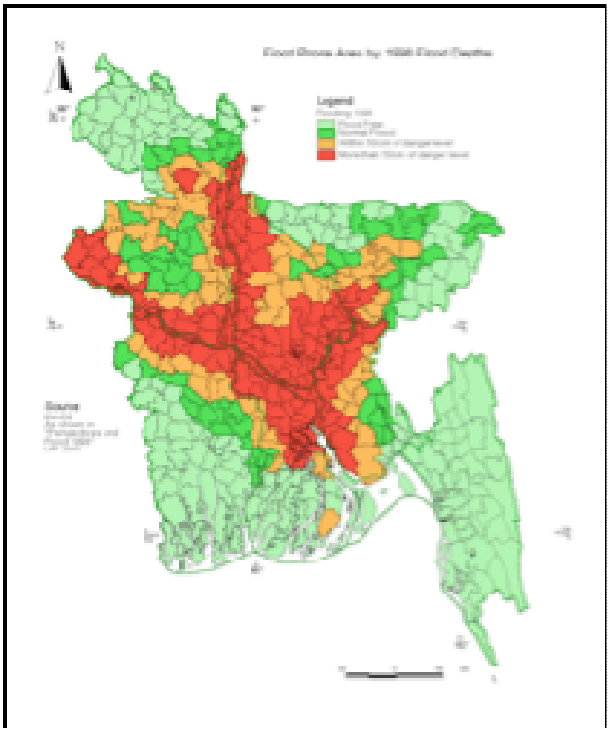


Figure 3: Flood Inundation Map 2007
Figure 4: Flood prone areas by 1998 flood depth (Source: BWDB, 2000)

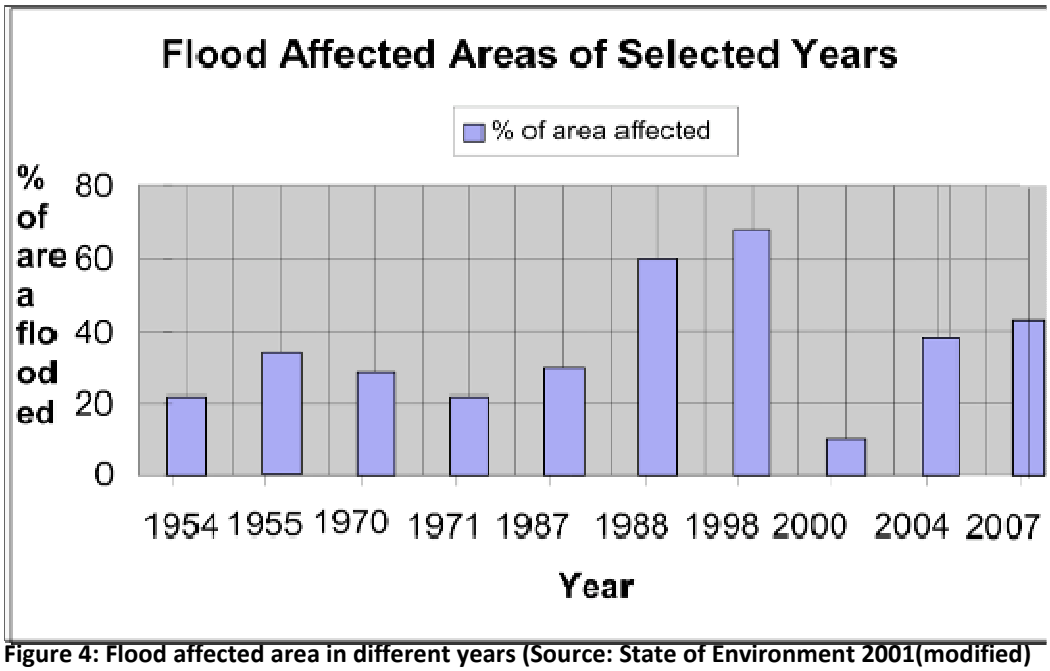


Figure 4: Flood affected area in different years (Source: State of Environment 2001(modified)

Flood 2007

Affected District	39
Affected Upazila	256
Affected Union, Affected Pourashava	2057 67
Families affected at present	22,86,564
Affected People	1,06,55,145
Death (drowning, snake bite etc)	554 (Source: MHFP)
Households (Full)	62,956
Households (Partial)	8,81,922

In the year 2000, Bangladesh faced an unusual flood over its usually flood-free south western plain, which also caused loss of life and massive damage to property. In 2004, floods inundated about 38% of the country (WARPO, 2005). About 747 people lost their lives. About 2,500 kilometers of embankment were damaged and about 74 primary school buildings were washed away. This flood caused economic losses of about US$2,200 Million. Floods continue to be major hazards in Bangladesh. To mitigate the impacts of floods, the government has been developing and implementing various measures to better equip the country to deal with floods. The Ministry of Water Resources (MoWR) is leading the country on flood mitigation initiatives. Important initiatives include Flood Action Plan, Flood Hydrology Study, Flood Management Model Study, National Water Management Plan, National Water Policy, Flood Early Warning System Study, etc.

2.2 CYCLONES AND STORM SURGES

Tropical cyclones from the Bay of Bengal accompanied by storm surges are one of the major disasters in Bangladesh. The country is one of the worst sufferers of all cyclonic casualties in the world. The high

number of casualties is due to the fact that cyclones are always associated with storm surges. Storm surge height in excess of 9m is not uncommon in this region. For example, the 1876 cyclone had a surge height of 13.6 m and in 1970 the height was 9.11 m (WARPO, 2005). In fact, the 1970 cyclone is the deadliest cyclone that has hit Bangladesh coastline. With a wind-speed of about 224 km per hour and associated storm surge of 6.1 to 9.11m, it was responsible for deaths of about 300,000 people. A list of devastating cyclones is given in Table 1.

Table 1: Major cyclones that hit the Bangladesh coast

Date		Maximum Wind speed (km/hr)	Storm Surge height (metres)	Death Toll
11 May	1965	161	3.7-7.6	19,279
15 December	1965	217	2.4-3.6	873
01 October	1966	139	6.0-6.7	850
12 November	1970	224	6.0-10.0	300,000
25 May	1985	154	3.0-4.6	11,069
29 April	1991	225	6.0-7.6	138,882
19 May	1997	232	3.1-4.6	155
15 November (SIDR)	2007	223	--	3363
25 May (AILA)	2009	92	--	190

Source: Bangladesh Meteorological Department 2007

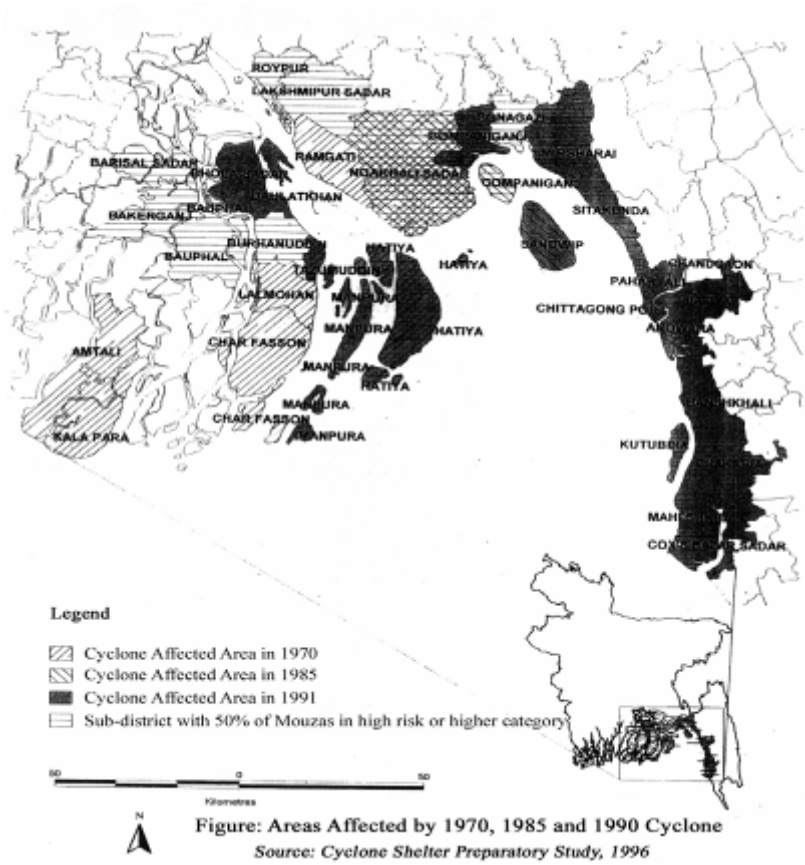


Figure: Areas Affected by 1970, 1985 and 1990 Cyclone

Source: Cyclone Shelter Preparatory Study, 1996

The Super Cyclone Sidr 2007

Cyclone Sidr 2007 erupted from the Bay of Bengal packing winds of 240 kilometers per hour, swept through the southwestern coastal areas within 155-miles radius of its eye with heavy rain and storm surges reached up to 15-20 feet high in some places on 15th November'07. According to Bangladesh Metrological Department, the Sidr's eye crossed the Khulna-Barisal coast near the Sunderbans mangrove forests around 9:30pm, while it crossed over the Baleshwar River in Barguna district at midnight. The coastal districts of Barisal Patuakhali, Borguna, Pirojpur, Jhalkthi, Bhola, Bagerhat, Khulna, Satkhira, Shariatpur, Chittagong and Cox's Bazar and their offshore islands and chars received the major destructions by the SIDR. Out of 12 severely affected districts, four are the worst affected, these are Bagerhat, Barguna, Pirojpur and Patuakhali.

As of the reporting period, it was observed that 3,363 peoples are dead and 55,282 are injured. Approximately 563,877 houses were totally destroyed and 9,55,065 houses were partly damaged. It is also reported that 186,883 hectares of crop areas are fully and 498,645-hectare area partly damaged by Sidr.

Table 2: Damage & Loss at a Glance:

Affected Districts	30
Most Affected Districts	12
Affected Upazillas	200
Affected Union/Municipality	1,950
Affected Families	2064026
Affected People	8923259
Fully Damaged Crop Fields	186,883 hectare
Partially Damaged Crop Fields	498,645 hectare
Fully Damaged Houses	563877

Affected Districts	30
Partially Damaged Houses	955065
Death Toll	3363
Injured Persons	55282
Missing Persons	871
Dead Cattle & Poultry	1778507
Fully Damaged Educational Institutions	4231
Partially Damaged Educational Institutions	12723
Fully Damaged Roads	1714 km
Partially Damaged Roads	6361 km
Damaged Bridge/Culvert	1687
Affected Dams	1875 km
Damaged Trees	4065316
Ferries	28 (out of 44) (13 restored)
Electricity	33kv line- 416 km, 11 kv line 287 km
Affected Tubed Wells	901 in 3 districts
Affected PSF (pond sand filter)	419 nos.
Affected SST (shallow shouted tubewell)/VST (very shouted tubewell)	55
Forest	US$ 5.6 Million
Death of wildlife (deer)	24 nos.
Roads & Highways	US$2.6 million
BWDB (embankments, sluice gates, riverbank protection structure)	US$27.0 million

Government's Immediate Response

The Government, in coordination with NGOs and international organizations, has done a commendable job in responding to the cyclone emergency and assisting the affected population. The MoFDM activated emergency response committees at the District, Upazilla, and Union levels and established an operations center in Dhaka to coordinate relief activities. Military personnel were deployed to assist with rescue operations and the distribution of food and relief services.

It may pointed out that due to the increase in the number of population and the cattle heads, it has become essential to construct at least 2,000 of disaster shelters & killas in the coastal areas. The Ministry of Primary & Mass Education has taken up a programme under the project title "Primary Education Development Programme-2 (PEDP-2)" to construct 507 schools-cum-shelters in the coastal areas. It is expected that the others Ministries, Divisions, Organizations and NGOs will also construct about 300 shelters. Considering this, the DM&RD has decided to construct the remaining 1,200 disaster shelters and killas as per the recommendations of the reports of the technical committee.

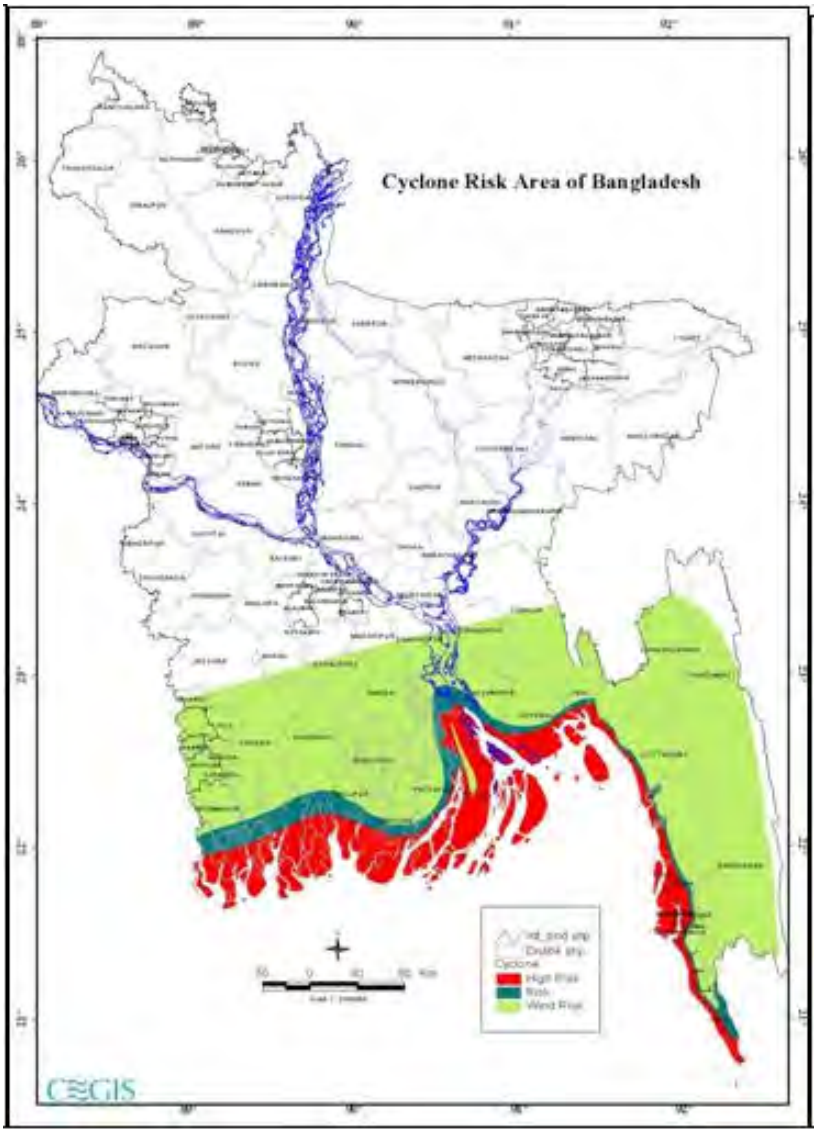


Figure 5: Cyclone-prone areas of Bangladesh

2.3 TORNADO

The two transitional periods between southwest and northeast monsoons over the Indian sub-continent are characterized by local severe storms. The transitional periods are usually referred to as pre-monsoon (March-May), and post-monsoon (October- November). It is the pre-monsoon period when most of the abnormal rainfall or drought conditions frequently occur in different parts of Bangladesh. Also there are severe local seasonal storms, popularly known as nor'westers *(kalbaishakhi)*. Severe nor'westers are generally associated with tornadoes. Tornadoes are embedded within a mother thundercloud, and moves along the direction of the squall of the mother storm. The frequency of devastating nor'westers usually reaches the maximum in April, while a few occur in May, and the minimum in March. Nor'westers and tornadoes are more frequent in the afternoon. Table 3 shows some of the devastating nor'westers and tornadoes that hit Bangladesh. Nor'westers may occur in late February due to early withdrawal of winter from Bangladesh, Bihar, West Bengal, Assam, and adjoining areas. The occasional occurrence of nor'westers in early June is due to the delay in the onset of the southwest monsoon over the region (Karmakar, 1989).

Table 3: Some of the devastating nor'westers and tornadoes
Source: Bangladesh: State of the Environment 2001 and web sources

14 April 1969	Demra (Dhaka)
17 April 1973	Manikganj (Dhaka)
10 April 1974	Faridpur
11 April 1974	Bogra
09 May 1976	Narayanganj
01 April 1977	Faridpur
26 April 1989	Saturia (Manikganj)
14 May 1993	Southern Bangladesh
13 May 1996	Tangail
04 May 2003	Brahmanbaria
21 March 2005	Gaibandha

Wind speeds in nor'westers usually do not exceed 113-130 km/hr (70-80 miles/hr), though often their speeds exceed 162 km/hr (100 miles/hr). When the winds become whirling with funnel shaped clouds having a speed of several hundred kilometers or miles per hour, they are called tornados. Nor'westers bring the much-needed pre-monsoon rain. They can also cause a lot of havoc and destruction. Tornados are suddenly formed and are extremely localized in nature and of brief duration. Thus, it is very difficult to locate them or forecast their occurrence with the techniques available at present. However, high-resolution satellite pictures, suitable radar, and a network of densely spaced meteorological observatories could be useful for the prediction or for issuing warnings of nor'westers and tornados.

2.4 RIVER BANK EROSION

This is an ongoing disaster and there is no specific indicator to measure the extent of damage. So the extent of damage caused by river erosion in most cases is based on various reports/information. Needless to say whatever the difference in ascertaining the extent of damage river erosion causes huge loss of property throughout the year. According to "World Disaster Report 2001" published by IFRCS every year about 10,00,000 people are affected by river erosion and 9,000 hectare cultivable lands are banished in river. Among these only a few affected people are able to find new shelters while others become homeless for uncertain period.

River erosion in Bangladesh is no less dangerous than other sudden and devastating calamities. Losses due to river erosion occur slowly and gradually. Though losses are slow and gradual, they are more destructive and far-reaching than other sudden and devastating calamities. The effects of river erosion are long-term . It takes a few decades to make up the losses, which a family has incurred by river erosion. There has been little progress, however, for improving the lives of erosion-affected people due to resource constraint.

Rivers in Bangladesh are morphologically highly dynamic. The main rivers are braided, and form islands or chars between the braiding channels. These chars, of which many are inhabited, "move with the flow" and are extremely sensitive to changes in the river conditions. Erosion processes are highly unpredictable, and not compensated by accretion. These processes also have dramatic consequences in the lives of people living in those areas. A study concluded in 1991 reported that: out of the 462 administrative units in the country, 100 were subject to some form of riverbank erosion, of which 35 were serious, and affected about 1 million people on a yearly basis. Around 10,000 hectares land is eroded by river per year in Bangladesh (NWMP, 2001). The erosion prone zones of Bangladesh are shown in the Figure 6. Kurigram, Gaibandha, Jamalpur, Bogra, Sirajganj, Tangail, Pabna and Manikganj districts lie in the erosion prone area along Jamuna River. Erosion of total area and settlement is higher along the left bank than that of the right bank. Along Padma River, there are the districts of Rajbari, Faridpur, Manikganj, Dhaka, Munshiganj, Shariatpur and Chandpur. A recent study of CEGIS (2005) shows that bank erosion along Padma River during 1973 – 2004 was 29,390 hectares and along Jamuna River during 1973 – 2004, it was 87,790 hectares. As relevant to this study, loss of land, settlements, roads and embankments due to erosion in 2004 in Sirajganj and Faridpur districts is shown in Table 4.

Table 4: Erosion of agricultural land, roads, embankments and settlements along the banks of the Jamuna and Padma in 2004 in Sirajganj and Faridpur districts

District	Upazila	Total Land (ha)	Eroded Infrastructures				
			Settlement (ha)	District Road (m)	Upazila Road (m)	Rural Road (m)	Embankment (m)
Sirajganj	Kazipur	177	50		176	84	1617
	Sirajganj Sadar	170	13	1		164	2107
	Belkuchi	0	0				
	Chauhali	207	45		395		
	Shahjadpur	148	31	159			
	Total	702	139	160	571	248	3724
Faridpur	Faridpur Sadar	200	57		1175	370	
	Char Bhadrasan	78	17	320			
	Sadarpur	3	1				
	Total	**281**	**75**	**320**	**1175**	**370**	

Source: CEGIS, 2005

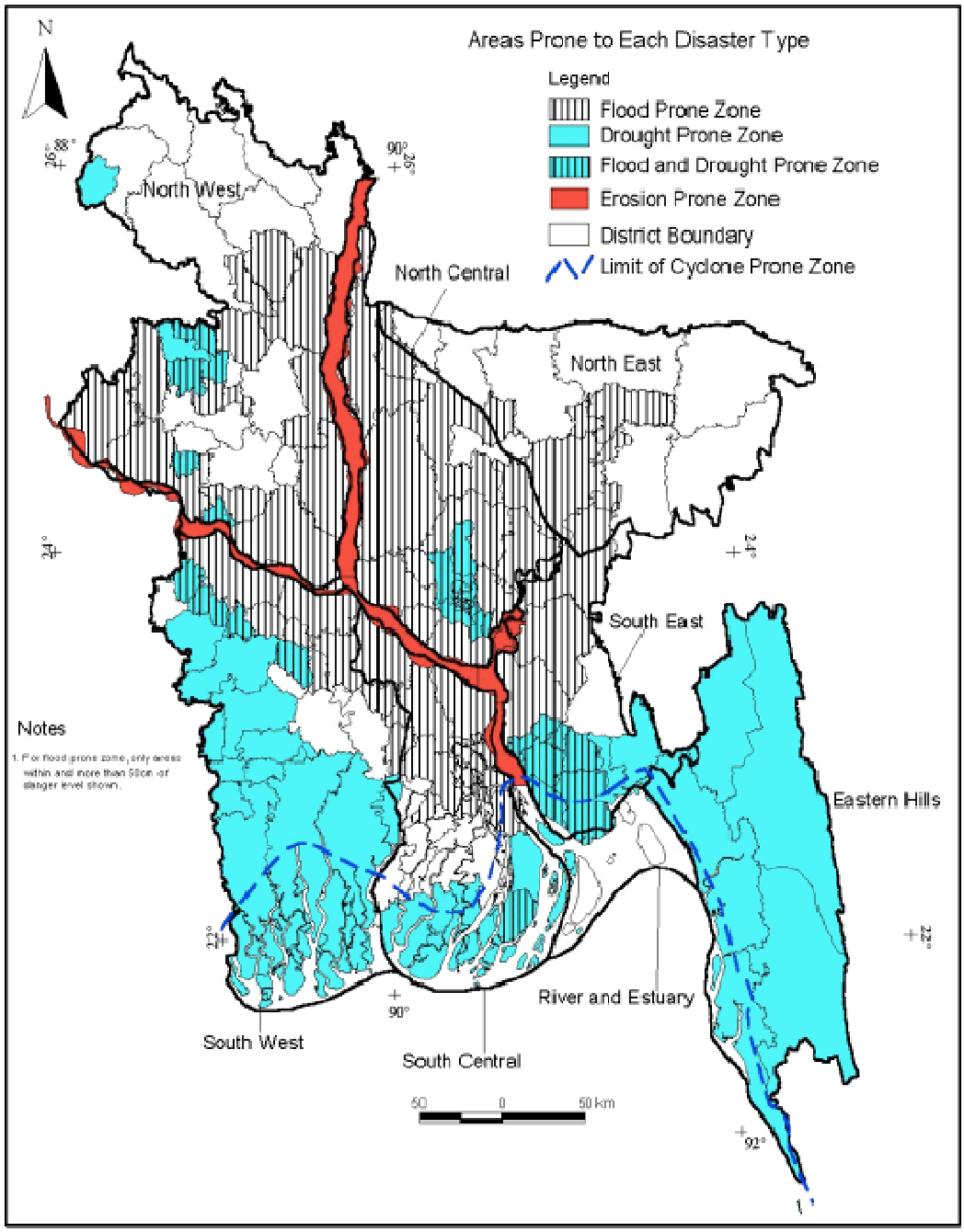


Figure 6: Areas Prone to Various Disasters, including River Erosion (Source: NWRD 2001)

2.5 EARTHQUAKE

Bangladesh and the northeastern Indian states have long been one of the seismically active regions of the world, and have experienced numerous large earthquakes during the past 200 years.

Many of seismic-tectonic studies have been undertaken on the area comprising the Indo-Burman ranges and their western extension and in the northern India. Major active fault zones of the country have been

delineated through geological trenching and dating methods. A list of reference of this is provided in Haque, (1990), using data from various sources. A seismic zoning map of Bangladesh has been proposed in 1979 by Geological Survey of Bangladesh (GSB) dividing the country into three seismic zone which was accompanied by and outline of a code for earthquake resistant design. Later, a new updated seismic zoning map and detailed seismic design provisions have been incorporated in Bangladesh National Building Code (BNBC 1993). A seismicity map of Bangladesh and its adjoining areas has also been prepared by BMD and GSB. Bangladesh has been classified into three seismic zones with zone-3 the most and zone-1 the least vulnerable to seismic risks (Figure 7).

Figure 7: Seismic Zoning Map of Bangladesh

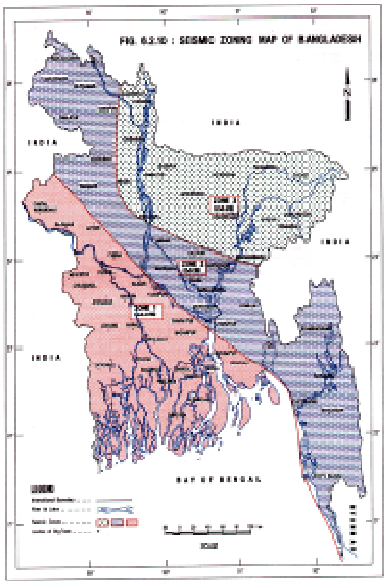


Table 5: List of Major Earthquakes Affecting Bangladesh

Date	Name	Magnitude (Richter)	Epicentral Distance from Dhaka (km)	Epicentral Distance from Sylhet City (km)	Epicentral Distance from Chittagong (km)
10 January, 1869	Cachar Earthquake	7.5	250	70	280
14 July, 1885	Bengal Earthquake	7.0	170	220	350
12 June, 1897	Great Indian Earthquake	8.7	230	80	340
8 July, 1918	Srimongal Earthquake	7.6	150	60	200
2 July, 1930	Dhubri Earthquake	7.1	250	275	415
15 January, 1934	Bihar-Nepal Earthquake	8.3	510	530	580
15 August, 1950	Assam Earthquake	8.5	780	580	540

Source: Choudhury, 2005

The record of approximately 150 years shows that Bangladesh and the surrounding regions experienced seven major earthquakes (with Mb = 7). In the recent past, a number of tremors of moderate to severe intensity had already taken place in and around Bangladesh. The Sylhet Earthquake (Mb = 5.6) of May 8, 1997, the Bandarban Earthquake (Mb = 6.0) of November 21, 1997, the Moheshkhali Earthquake (Mb = 5.1) of July 22, 1999, and the Barkal (Rangamati) Earthquake (Mb=5.5) of July 27, 2003 may be cited as examples (Source: Choudhury, 2005).

2.6 DROUGHT

Bangladesh faces unpredictable drought hazard in the dry monsoon due to inadequate and uneven rainfall. It varies from place to place, however, and the northwestern region suffers most from the drought. As much as 17% of the *Aman* crops, the main paddy crops in the wet season, may be lost in a typical year due to drought. Though this is an annual phenomenon, the last severe drought faced by Bangladesh was in 1994. In view of persistent food shortage, this is a catastrophe. In this paper, the role of surface water irrigation projects in drought management in Bangladesh has been discussed.

Drought affects not only seasonal crops, but also fruit-bearing trees, forestry and the environment as a whole. Moreover, the crop environment during the monsoon (Kharif-II) season is not favorable for achieving full potential yields because of uneven distribution of rainfall, flooding etc. To combat the drought, it is essential for Bangladesh to utilize its water resources, both surface and groundwater. However, Bangladesh has increasingly used her groundwater resources to such as extent that the depletion of groundwater resources as well as arsenic contamination is occurring at alarming rate in the ground water reservoirs due to over and unplanned withdrawal. The scope of increasing the irrigation areas by LLP is limited.

In these circumstances, there is no option but to use surface water to meet the water deficit created by droughts in the Kharif-II season and hence, surface water utilization projects such as barrages across the rivers, installation of pumping plants for lifting water from the rivers are essential.

Drought is an abnormal condition where there is a lack of sufficient water to meet the normal needs of agriculture, livestock, industry, or for human use. While generally associated with semi-arid or desert climates, droughts can also occur in areas that normally enjoy adequate rainfall, and moisture levels (ADB, 1991). It is the result of insufficient or no rainfall for an extended period, and causes a considerable hydrological (water) imbalance. The ensuing water shortage leads to stream flow reduction, depletion of ground water and soil moisture, and hence, crop damage. In drought conditions, evaporation and transpiration exceed normal levels. If it continues for a prolonged period, a serious threat is posed to agricultural production. In the agricultural context drought affects rice production the most. Based on drought severity, crop loss ranges between 20->60% for T. Aman and other rice varieties (Iqbal, 2000). It is one of the most insidious causes of human misery. Basically, there are three types of droughts in Bangladesh:

- Permanent drought characterizes regions with the driest climate, having sparse vegetation that is adapted to aridity. Agriculture cannot be practiced without irrigation.
- Seasonal drought occurs due to abnormal rainfall shortage in places where there are well-defined annual rainy and dry seasons.
- Unpredictable drought involves an abnormal rainfall failure, mostly in localized areas of humid and sub-humid climates.

Bangladesh is at higher risk from droughts. Between 1949 and 1991, droughts occurred in Bangladesh 24 times. Very severe droughts hit the country in 1951, 1957, 1958, 1961, 1972, 1975, 1979, 1981, 1982, 1984 and 1989. Past droughts have typically affected about 47% area of the country and 53% of the population (WARPO, 2005). Figures 8 shows the drought prone areas of Bangladesh.

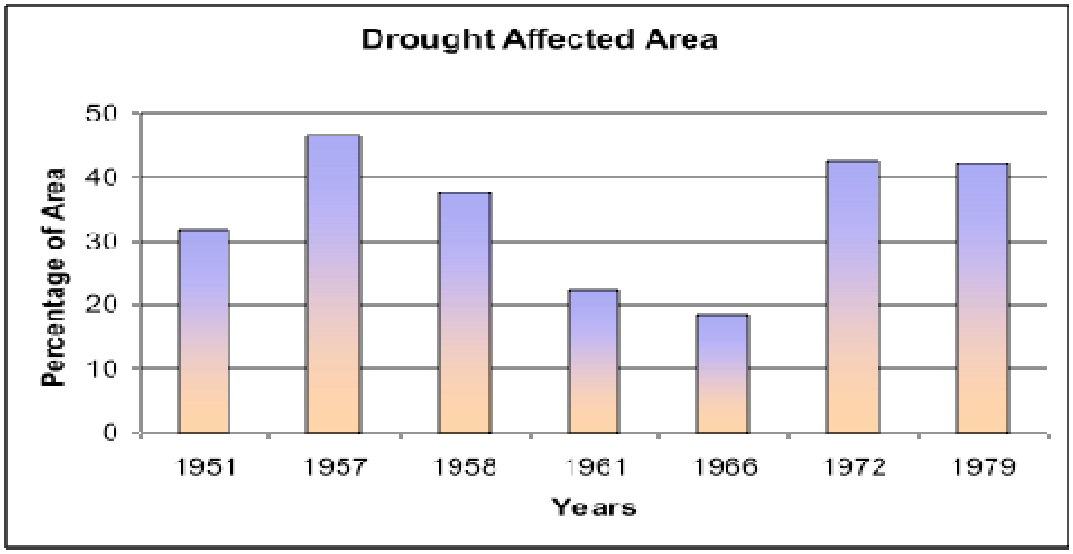


Figure 8: Drought affected areas of Bangladesh in different years (Source: SoE 2001).

Drought conditions due to deficiency in rainfall affect different parts of Bangladesh mostly during the pre-monsoon and post-monsoon periods. One study has shown (Figure 8) that from 1949 to 1979, drought conditions had never affected the entire country and total population in any drought year. The drought of 1979 was one of the most severe in recent times. The percentage of drought-affected areas was 31.63 percent in 1951, 46.54 percent in 1957, 37.47 percent in 1958, 22.39 percent in 1961, 18.42 percent in 1966, 42.48 percent in 1972, and 42.04 percent in 1979 (Chowdhury & Hussain. 1981. As reported in SOE 2001). During 1981 and 1982, drought affected the production of the monsoon crop only.

2.7 ARSENIC CONTAMINATION

At present, arsenic contamination is considered to be a dangerous environmental threat and a serious health risk. It is identified as a public health emergency in Bangladesh. There is no specific treatment for chronic arsenicosis other than ceasing further intake of arsenic contaminated water and raising awareness of the population about the problem.

The value (recommended limit) for arsenic in drinking water as per the guideline of the World Health Organization (WHO) is 10 mg/L while the national standard in most countries, including Bangladesh, is 50

mg/L. With varying levels of contamination from region to region, groundwater in 61 out of the 64 districts in Bangladesh is contaminated with arsenic. According to a study conducted by the British Geological Survey and DPHE, Bangladesh, arsenic concentrations in the country range from less than 0.25 mg/L to more than 1600 mg/L. This study report estimates that out of the Bangladesh population of 125.5 million, up to 57 million people drink water that has an arsenic concentration greater than the WHO guideline value and up to 35 million people consume water that has concentrations in excess of the Bangladesh standard. The waters in the southwest and southeast parts of Bangladesh are highly contaminated with arsenic (Figure 9). Important government initiatives to mitigate risk to arsenic contamination include development of the National Policy for Arsenic Mitigation 2003 and the Implementation Plan for Arsenic Mitigation in Bangladesh.

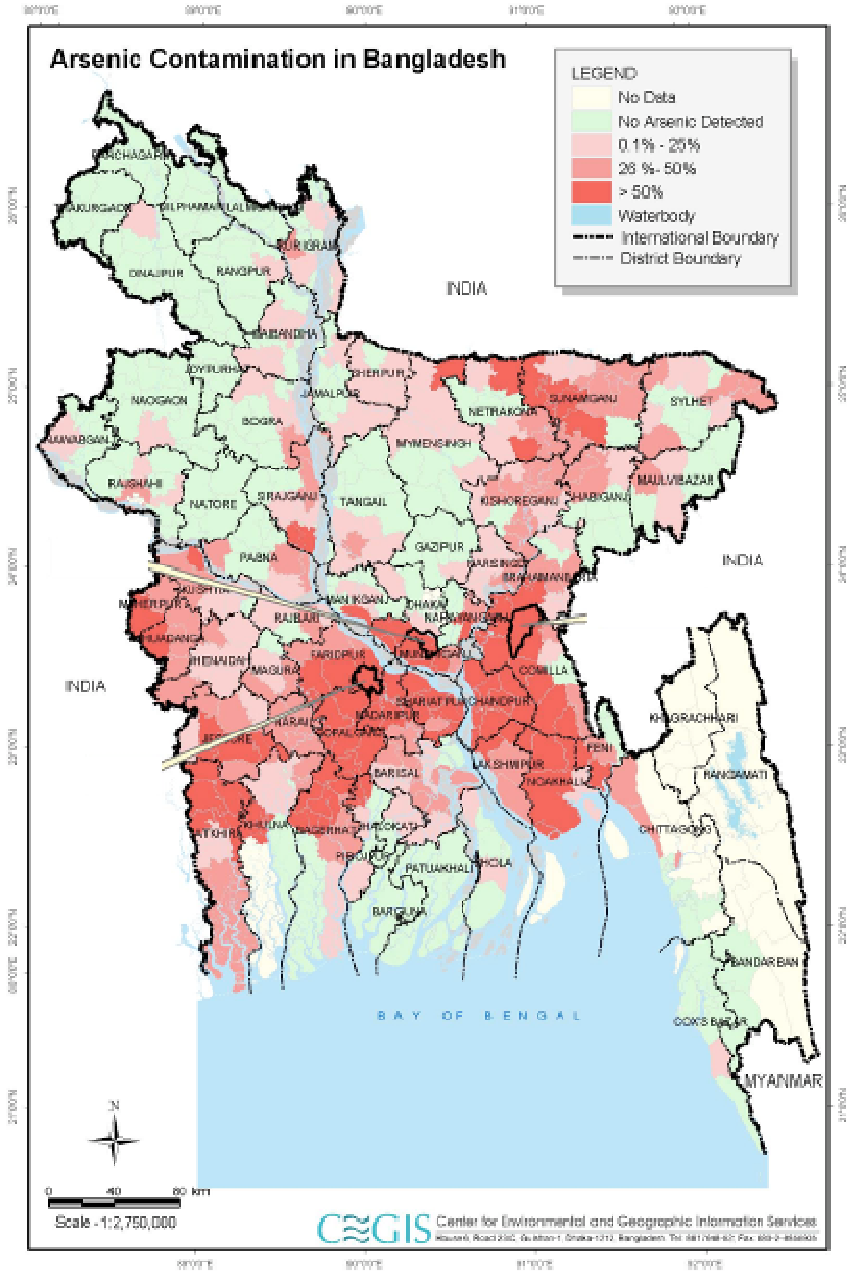


Figure 9: Arsenic contamination status in Bangladesh

2.8 SALINITY INTRUSION

Saline water intrusion is mostly seasonal in Bangladesh; in winter months the saline front begins to penetrate inland, and the affected areas rise sharply from 10 percent in the monsoon to over 40 percent in the dry season. Coastal districts such as Satkhira, Khulna, Bagerhat, Barguna, Pataskala, Barisal are the victims of salinity intrusion. Agricultural production, fisheries, livestock, and mangrove forests are affected by higher salinity in the dry season. It is observed that dry flow trend has declined as a result of which sea flow (saline water) is traveling far inside the country resulting in contamination both in surface and ground water.

Salinity data from Land Reclamation Programme (LRP) and Meghna Estuary Study (MES) indicate an enormous seasonal effect due to the influence of huge fresh water discharge from the Lower Meghna River on the horizontal distribution of salinity in the estuary. This distribution is strongly influenced by the fresh water flow in the Lower Meghna River. Figures 10 and 11 present the movement of the 1 ppt salinity line during monsoon and dry season respectively. High salinity both in monsoon and dry season in the southwest corner and along the Pussur-Sibsa system of the area is associated with the decreasing upstream freshwater flow as well as silting of major channels (WARPO, 2005).

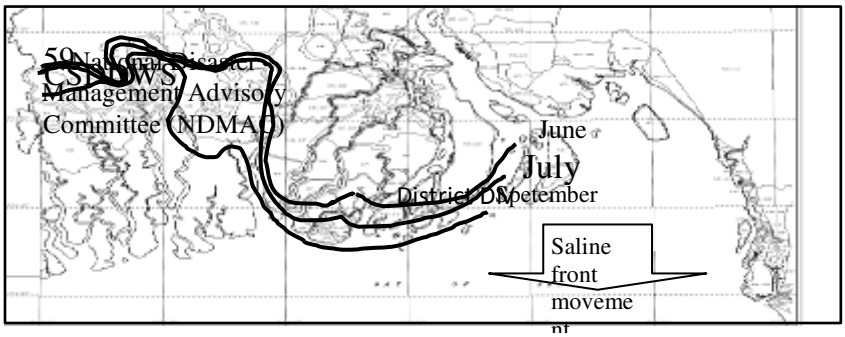


Figure 11: Movement of saline front of 1 ppt in the monsoon season (June to September)

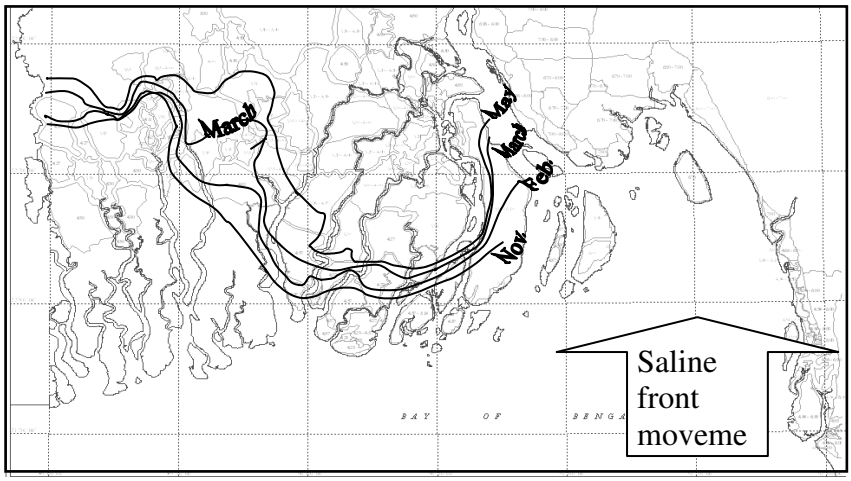


Figure 12: Movement of saline front of 1 ppt in the dry season (November to May)

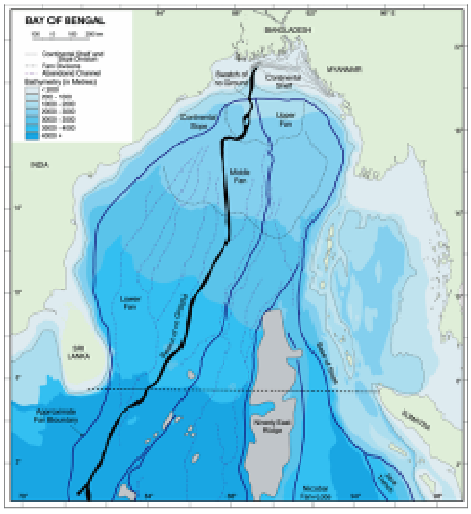
2.9 TSUNAMI

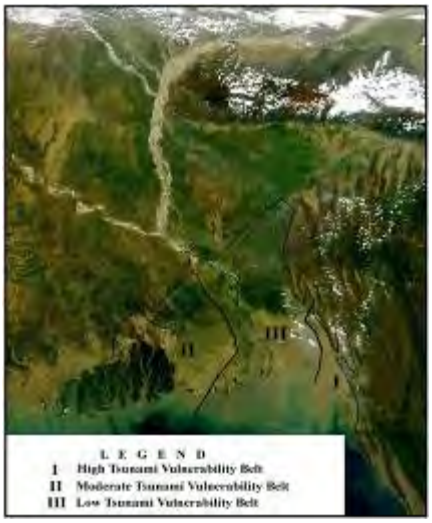
Underwater strong earthquakes, volcanic eruption or other submarine landslide usually causes tsunamis. When earthquake occur offshore at seduction zones (places where a tectonic plate that carries an ocean is gradually slipping under a continental plate). Some tsunamis can be very large. In coastal areas their height can be as great as 30 feet or more (100 feet in extreme cases), and they can move inland several hundred feet. A tsunami consists of a series of waves. Often the first wave may not be the largest. The danger from a tsunami can last for several hours after the arrival of the first wave. Tsunamis can move faster than a person can run. Tsunamis can occur at any time, day or night.

Tsunami impact: although infrequent, tsunamis are among the most terrifying and complex physical phenomena and have been responsible for great loss of life and extensive destruction to property. Because of their destructiveness, tsunamis have important impacts on the human, social, and economic sectors of societies. The last major Pacific-wide tsunami occurred in 1960. Many other local and regional destructive tsunamis have occurred with more localized effects.

Before the Asia Tsunami 2004, a few Bangladeshis ever thought that Bangladesh was vulnerable to tsunami hazards. However, the 2004 Asia Tsunami raised the question why Bangladesh was not hit by the Tsunami. Bangladeshi scientists put together the following reasons:

1. Long distance from the Epicenter
2. Long Continental Shelf (about 200 km) at the front of Ganges- Brahmaputra active Delta System
3. Thick sedimentation in Bengal fan
4. High density of seawater in Bay of Bengal around / along the coast (suspended load)
5. Anti-clockwise oceanic current at Bay of Bengal (winter season)





Considering the state of tsunami vulnerability and potential seismic sources, Geological Survey of Bangladesh has divided the Bangladesh coastal belt into three zones:

a) **Tsunami Vulnerable Zone- I** (Chittagong-Teknaf coastline): Most vulnerable. The intra-deltaic coastline is very close to the tectonic interface of Indian and Burmese plates. The active Andaman-Nicobar fault system is often capable of generating tsunami waves.

b) **Tsunami Vulnerable Zone- II** (Sundarban-Barisal coastline): Moderately vulnerable. This old deltaic belt is extremely vulnerable to local tsunamis due to presence of Swatch of No Ground.

c) **Tsunami Vulnerable Zone- III** (Barisal-Sandwip estuarine coastline): Low vulnerability. The estuarine coastal belt considered to be less vulnerable due to presence of numerous islets and shoals in the upper regime of the continental shelf.

Bangladesh needs detailed study to scientifically assess the Tsunami vulnerability. Bangladesh also needs to develop a Tsunami early warning system and mass awareness of Tsunami threat at the coastal areas.

2.10 FIRE

Fire hazards occur frequently in Bangladesh. Fire causes huge loss of lives and properties every year. Although termed as 'fire accident', most fire events are far from being accidental. Indeed, most fires are preventable. Industrial units, particularly garments industry, produce deadliest of the fires. For example, a fire broke out on 6 January 2005 on the fourth-floor of a building housing a factory in Narayanganj. It took fire fighters four hours to extinguish the blaze. Dozens of workers were injured as they desperately tried to escape down the narrow smoke-engulfed stairs. About 23 people died because they were unable to escape because many of the exits were blocked, and the fire extinguishers were not working.

Tragically, factory fires are all too common in Bangladesh. Whenever a fire occurs, the authorities are usually asked to investigate the fire, pay exemplary compensation to the survivors as well as to the families of those that died, take immediate steps to improve health and safety in the industry, as well as take legal action against those found responsible for criminal negligence in allowing the existence of such unsafe conditions. Fire incidents in the country are increasing at an alarming rate. In 2004 alone, a total of 7,140 fire incident occurred which caused damage to property worth more than Tk. 200 crore.

2.11 INFRASTRUCTURE COLLAPSE

A nine-storied building housing a garments factory at Palashbari, Savar, Dhaka collapsed at around 1 am on 11 April 2005. It was a total structural failure. Local administration, especially the Fire Brigade and Bangladesh Army quickly rushed to the spot just after the collapse. NGOs, construction companies and other organizations joined later. Around 40 to 50 people were rescued alive during that night, and rescue operations completed on 19 April 2005. Scores of people died.

Lessons learned from the operation includes the following: a) Site was inaccessible to the equipments: almost all the required equipments were mobilized but sitting idle due to their inaccessibility to the site, b) Unfamiliarity with the understanding and practical collapse condition, c) Lack of awareness of mass people on the stages of rescue operations, and d) Insufficient /lack of appropriate modern equipments to rescue victims alive.

Incidents of infrastructure collapse are on the rise. Prevention and preparedness programmes are absolute necessary at the time.

2.12 LANDSLIDE

Large and small landslides occur almost every year in nearly all regions of the world. In the past, landslide was not considered a major hazard in Bangladesh. However, recently landslide has emerged as a major hazard, particularly after the Chittagong Landslide 2007. Due to heavy rainfall during 10 -11 June 2007, landslides and collapsed walls caused widespread damages in six areas of Chittagong city and in different Upazilas of the District. 50mm of rainfall was recorded from 12:00 AM on 10 June 2007 to 6:00 AM on 11 June 2007, and 315mm of rainfall was recorded from 6:00am to 2:00 PM on 11 June 2007. More than 120 people have been reported dead due to Chittagong landslide.

Landslides are a complex-disaster phenomenon that can be caused by earthquakes, volcanic eruptions, heavy rainfall (typhoons, hurricanes), sustained rainfall, heavy snowmelt, unregulated anthropogenic developments, mining, and others. In Bangladesh, landslides are mostly triggered by heavy rainfall. However, underlying causes of landslide include deforestation, hill cutting, unregulated development work, etc. Moreover, poverty and landlessness force poor people to live in the risky hill-slopes.

3. CLIMATE CHANGE

3.1 GLOBAL CLIMATE CHANGE AND IPCC REPORTS ON BANGLADESH

The UN Intergovernmental Panel on Climate Change (IPCC) in its Fourth Assessment Report concludes that human activities are leading to global warming and climate change. According to the report, human-made emissions of greenhouse gases can be blamed for the harmful effects of climate change. Bangladesh is currently ranked as the most climate-vulnerable country in the world. IPCC (2007) in its Fourth Assessment report described following changes in climate trends, variability and extreme events:

- In Bangladesh, the average temperature has registered an increasing trend of about 1°C in May and 0.5°C in November during the 14 year period from 1985 to 1998.
- The annual mean rainfall exhibits increasing trends in Bangladesh. Decadal rain anomalies are above long-term averages since 1960s.
- Serious and recurring floods have taken place during 2002, 2003, and 2004. Cyclones originating from the Bay of Bengal have been noted to decrease since 1970 but the intensity has increased.
- Frequency of monsoon depressions and cyclones formation in Bay of Bengal has increased.
- Water shortages have been attributed to rapid urbanization and industrialization, population growth and inefficient water use, which are aggravated by changing climate and its adverse impacts on demand, supply and water quality.
- Saltwater from the Bay of Bengal is reported to have penetrated 100km or more inland along tributary channels during the dry season.
- The precipitation decline and droughts has resulted in the drying up of wetlands and severe degradation of ecosystems.

The IPCC Working Group II has reported in their fourth assessment that the production of rice and wheat might drop in Bangladesh by 8 percent and 32 percent respectively by the year 2050. Bangladesh is especially susceptible to increasing salinity of their groundwater as well as surface water resources, especially along the coast, due to increases in sea level as a direct impact of global warming. With a 1m rise in sea level, the Sunderban mangrove forest is likely to be lost; Bangladesh would be worst affected by the sea level rise in terms of loss of land. Approximately 1,000 square kilometers of cultivated land and sea product culturing area is likely to become salt marsh. Projected sea-level rise could flood the residence of millions of people living in the low-lying areas such as in Bangladesh. Even under the most conservative scenario, the sea level will be about 40 cm higher than today by the end of 21st century and this is projected to increase the annual number of people flooded in coastal populations from 13 million to 94 million worldwide. Almost 60 percent of this increase will occur along the coast in South Asia. The coastal lowlands below the elevation of 1,000-year storm surge are widely distributed in Bangladesh where millions of people live. Global burden (mortality and morbidity) of diarrhoea and malnutrition attributable to climate-change are already the largest in Bangladesh. The relative risks for these conditions for 2030 are also expected to be the largest. Bangladesh's population is expected to increase by 130 million more people over the next 50 years. Climatic changes in Bangladesh would likely exacerbate present environmental conditions that give rise to land degradation, shortfalls in food production, rural poverty and urban unrest. About 15,000 Himalayan glaciers form a unique reservoir that supports perennial rivers such as the Indus, Ganges and Brahmaputra, which, in turn, are the lifeline of millions of people in Bangladesh (IPCC, 2007).

3.2 CLIMATE CHANGE: OBSERVED IN BANGLADESH

Impacts of climate change are visible in Bangladesh in the form of temperature extremes, erratic rainfall, and increased number of intensified floods, cyclones, droughts, prevalence of rough weather in the Bay.

Bangladesh experienced the lowest temperature (5°C in the three northern districts) recorded in 38 years during January 2007. Over 100,000 people were affected, and the death toll due to cold-related diseases reached over 130. Crop production was also affected. Extreme high temperature in 14 years (42.08°C in Jessore) was been recorded on 27 April 2009. A record number of patients, since the installation of the facility 45 years ago, were admitted to ICDDR,B.

Intense rainfall in a short spell of time, described as a climate change impact in the IPCC report, is happening in Bangladesh. There was 333mm of rainfall in Dhaka on 28 July 2009 (290mm in six hours, a record six-hour rainfall for the capital in 60 years) resulted in serious drainage congestion. A total of 408mm rainfall in Chittagong (measured on 11 June until 9 pm, the heaviest in 25 years) resulted in a landslide killing at least 124 people. On the other hand there was 21% less rain during the monsoon period (June-August) in 2009 and the northern districts suffers from drought. Droughts were reported even in the coastal zone.

An increased number of severe floods hit Bangladesh in the last decade. Recurring floods occurred in 2002, 2003, 2004, and twice in 2007 (July-August and September). Flash flood occurring in the hilly terrain of eastern and north eastern part of Bangladesh has been increasing and also occurring a few days earlier in recent years than 40-50 years ago (community perception). The community perception has been confirmed by analyzing upper catchments rainfall. Increased rainfall (from an average of 150mm to 250mm) in Meghalaya in March in the last 30 years has increased. The Haor basin, a single crop area (winter rice), hosts over 20 million of people.

Similarly, the number of cyclone reaching landfall and storm surges also increased substantially. For example, Super Cyclone Sidr hit on 15 November 2007 (estimated damage BDT 113 billion (USD 1.6 billion), Cyclone Nargis on 2 May 2008 hit Myanmar, Cyclone Rashmi occurred on 27 October 2008, and Cyclone Aila hit Bangladesh on 26 May 2009. The number of days with cautionary Signal No. 3 or more increased substantially, reducing the number of fishing days for coastal fishers.

In the dry season, 5ppt isohaline intruded more than 90 km landward (than monsoon period, base year 2005) at the western part of the coastal area in the Sundarbans.

The coastal zone of Bangladesh hosts over 35 million of people who are exposed to cyclones, storm surges, rough seas, salinity intrusion and permanent inundation due to sea level rising. There are 72 offshore islands with an area of 4,200 square km2where over 3 million people are extremely vulnerable. About 18 percent households of the Sundarbans impact zone are dependent on Sundarban resources (shrimp fry collectors, honey collectors, golpata collectors, shell/crab collectors and medicinal plant collectors) and are vulnerable to the weather extremes and salinity intrusion. Around 0.5 million households' (family members 2.7 million) primary income source is fishing and they lose working days because of rough weather in the Bay. Over 160,000 coastal fishermen and an estimated 185,000 shrimp fry collectors are involved in marine fisheries.

Future climate change scenarios for Bangladesh: The changes in the climatic parameters as observed will continue. Downscaling the global climatic scenarios using regional climate model PRECIS for Bangladesh, it was found that pre-monsoon rainfall will be reduced; monsoon and post-monsoon rainfall will be increased; from 2051 onwards monsoon rainfall will follow a higher increasing trend; annual average rainfall will follow an increasing trend. The monthly average maximum temperature will increase in the monsoon period and will decrease in other periods. The monthly average minimum temperature will

increase in all periods and the Annual Maximum and Minimum temperature will follow an increasing trend (CCC, 2009).

Disaster risk reduction with climate change adaptation offers a win-win opportunity: Climate system is fundamental for both issues: 75% of all disasters originate from weather-climate extremes. Disaster risk reduction and adaptation to climate change strategies both are aimed at enhancing sustainability, resilient societies and human security. Similar sectoral focus, complexities and challenges rely on the same type of measures and policies. Disaster risk reduction offers opportunities for "bottom-up" strategies for adaptation to current climate variability and climate extremes. In this respect, disaster risk reduction can promote early adaptation to climate risks and impacts.

Adaptation is an adjustment in natural and human systems, which occurs in response to actual or expected climate changes or their effects. In human systems, adaptation can reduce harm or utilize opportunities. Adaptation is a matter of acceptance at the cognitive level of the exposed entity. Disaster Risk Reduction (DRR) is development & application of policies and practices that minimizes risks to vulnerabilities and disasters, applies to managing and/or responding to current disaster risks. In this regard disaster risk reduction options are the front line adaptation. Current risk reduction will lead to reduction of anticipatory risks of climate change in the form of adaptation. The disaster risk reduction options that best suit the user and accepted by them will eventually emerge as adaptation options.

Bangladesh Climate Change Strategy and Action Plan (BCCSAP) 2009 rightly weighted the linkage of the climate change and disaster potentials and appropriately taken disaster management as one of the pillar of strategy which are: Food security, Social protection and health, Comprehensive disaster management, Infrastructure, Research and knowledge management, Mitigation and low carbon development and Capacity building and institutional strengthening.

4. DISASTER DEVELOPMENT LINKAGES: NATIONAL AND INTERNATIONAL DRIVERS FOR CHANGE

4.1 MILLENNIUM DEVELOPMENT GOALS

The Millennium Declaration of September 2000 identified, among others, the following key objectives:

Protecting the vulnerable

"We will spare no effort to ensure that children and all civilian populations that suffer disproportionately the consequences of natural disasters…are given assistance and protection so that they can resume normal life as soon as possible."

Protecting our common environment, resolving to "intensify cooperation to reduce the number and effects of natural and man-made disasters".

Its principal goals include the following:

1. Eradicate extreme poverty and hunger
2. Achieve universal primary education
3. Promote gender equality and empower women
4. Reduce child mortality
5. Improve maternal health
6. Combat HIV/AIDS, malaria and other diseases
7. Ensure environmental sustainability
8. Develop a global partnership for development

4.2 POVERTY REDUCTION STRATEGY PAPER (PRSP), BANGLADESH

Poverty-disaster interface in Bangladesh is quite perplexing. Disasters have had an adverse long-term impact on economic and social activities of the poor. Additionally, the poor are more vulnerable to any kind of disaster due to a) depletion of assets, b) income erosion due to loss of employment, c) increased indebtedness and d) out migration. Moreover, the cost to cope with disasters is disproportionately higher for the poor.

The Poverty Reduction Strategy Paper is a policy and strategy document prepared by World Bank and the IMF member countries in broad consultation with stakeholders and development partners, including the staffs of the World Bank and the IMF to be updated every three years with annual progress reports. It describes the country's macroeconomic, structural and social policies and programs in support of growth and poverty reduction, as well as associated external financing needs and major sources of financing.

For WB and the IMF financing it is the basis for concessional lending from IMF and the WB for the low-income countries and debt relief under the WB-IMF Heavily Indebted Poor Countries (HIPC) initiatives.

The principal goal of the Bangladesh Government's economic policy is to reduce poverty so as to gradually lift the vast majority of the people above the poverty line and improve the quality of life for the average citizen. Developing homegrown poverty reduction strategies (PRSs) along with operational plans suited to the particular circumstances and needs of Bangladesh with a focus of long-term vision was thus the objective of Bangladesh PRSP.

The core principle of the Bangladesh PRSP includes the following:

- It is country-driven and promotes national ownership of strategies through broad-based participation of civil society;
- It is result-oriented and focused on outcomes that will benefit the poor;
- It is comprehensive in recognizing the multidimensional nature of poverty;
- It is partnership-oriented and involves coordinated participation of development partners (government, domestic stakeholders, and external donors); and
- It is based on a long-term perspective for poverty reduction.

The poverty reduction strategy framework in Bangladesh is as follows:

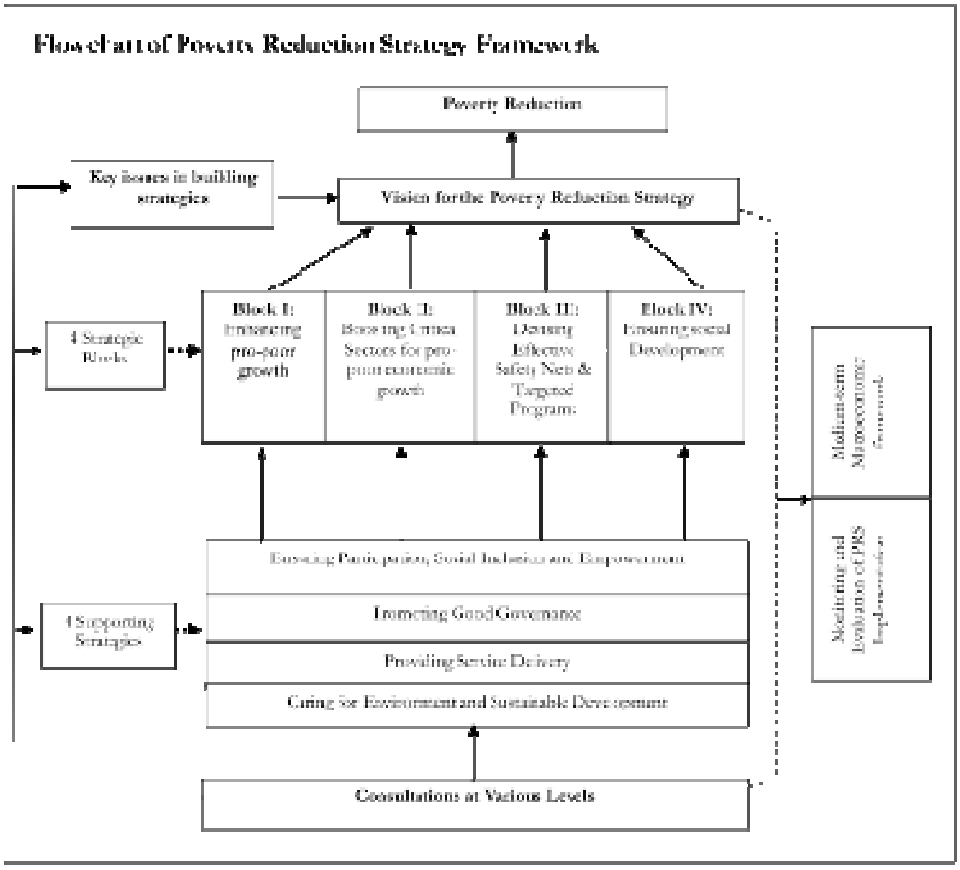


Figure 13: Poverty Reduction Strategy Framework

Considering the direct poverty disaster linkages the Bangladesh PRSP included one separate policy matrix Number 07 on comprehensive disaster management towards poverty reduction and growth. Disaster Management as a cross-cutting issue is being included in the following three other policy matrices:

a) Policy Matrix 08: Food security
b) Policy Matrix 12: Promote use of ICT in Disaster Management
c) Policy Matrix 15: Ensure social protection for women against vulnerability and risks

The Policy Matrix 07 envisages:

- Mainstreaming disaster management and risk reduction into national policies, institutions and development processes (introduction of Disaster Impact and Risk Assessment (DIRA).
- Strengthening disaster management and risk reduction capacity.
- Ensuring knowledge management (acquiring, storing, sharing and applying) on disaster risk reduction.
- Enhancing community level capacity for disaster risk reduction (community level preparedness, response, recovery and rehabilitation).

Ensuring social protection of women, children, elderly, people with disability and other vulnerable groups against vulnerability and risk.

PRSP II: Step Towards Change

Bangladesh Government has adopted the 2nd PRSP (PRSP-II, Step towards Change) as the medium term strategy for the financial year 2009-2011 and thereby poverty reduction endeavors will be strengthened and Millennium Development Goal (MDG) will be achieved. The total projected amount for the implementation of PRSP-II is 345,740 crores taka. The Government is analyzing the PRSP in the light of their political philosophy and election pledge to mass people (i.e. Vision 2021). Vision 2021 considers both the long-term and short-term. During the tenure of the current government, poverty will be reduced by 30% and the total poor will be reduced to 45 million through providing high priority to the agriculture sector, rural development and employment. On the other hand, the long-term goal of Vision 2021 is a poverty-free Bangladesh and to achieve this, infrastructure, human resources development, continuous investment and high growth rate are to receive special priority. PRSP-II identifies coordination among different ministries, skills to implement projects and a strong monitoring system as the main challenges. Following are the main indicators of PRSP-II and Vision 2021:

1. Improve the GDP growth rate to 8% by 2013 and 10% by 2017.
2. Reducing the rate of living under poverty line to 15%.
3. Increasing the primary enrolment to 100% by 2010, making tuition fee free for education up to graduate level by 2013 and ensuring 100% literacy by 2014.
4. Ensuring self-reliance in food.
5. Ensuring safe drinking water for all by 2011, sanitation for all by 2013, and housing for all by 2015.
6. Reducing matrimonial death rates to 1.5% and child death rates to 15%.
7. Production of 7,000 MW power by 2013, 8,000 MW by 2015 and 20,000 MW by 2021.
8. Increasing the employment rate to 85%.

4.3 RECOMMENDATIONS OF THE NATIONAL WORKSHOP ON OPTIONS FOR FLOOD RISKS AND DAMAGE REDUCTION IN BANGLADESH, 2004

In 2004, Bangladesh experienced one of the most devastating floods in nearly 50 years. About 38% of the country went underwater. The damage caused by the flood was to the tune of US$2 billion. Millions of people were affected. The most affected were the poor – the most vulnerable in such disasters.

In the backdrop of the devastating 2004 flood, on 7-9 September a national workshop was convened with the Prime Minister's Office on "Options for Flood Risks and Damage Reduction in Bangladesh". The workshop was attended by about 900 participants, including scientists, academicians, engineers, government servants, social workers, NGO leaders, defence personnel, businessmen and industrialists, representatives from development partners and the private sector. The objective of the workshop was to develop/design a context-based set of policy recommendations for flood management in Bangladesh and to evaluate the experiences of flooding and flood management initiatives and lessons learnt from

different kinds of interventions in the flood plains. The workshop also explored socio-economic aspects of the problem.

The workshop was inaugurated by the Honourable Prime Minister. Honourable Ministers from the Ministries concerned were present throughout the seminar. The workshop started with presentation of three keynote papers from three very eminent experts on water resources, community participation and economy. Thereafter, the workshop broke up into parallel working group sessions along six broad themes. The themes included: (i) Working Group 1: Flood & Disaster Management and Mitigation Options, (ii) Working Group 2: Impact of Flood on National Transportation and Mitigation Options, (iii) Working Group 3: Impact to Flood on Agriculture, Livestock, Fisheries & industries Sector and Mitigation Options, (iv) Working Group 4: Impact of Flood on Housing, Urban Planning Utilities (Water Supply, Sanitations) & Environment and Mitigation Options, (v) Working Group 5: Impact of Flood on Social Services and Law & Order and Mitigation Options, (vi) Working Group 6: Impact of Flood on Economy Major Infrastructures and Livelihood and Mitigation Options.

The workshop came up with a total of 323 recommendations of which 87 recommendations were directly related to the Disaster Management and Relief Division.

As a follow-up to the workshop, a detailed implementation plan of all the recommendations were prepared with the direct involvement from the Ministries and departments concerned. The Plan also identified the resource requirements, timeframe and the probable development partners.

4.4 HYOGO FRAMEWORK FOR ACTION (HFA) 2005-2015

On January 18-22, 2005, the World Conference on Disaster Reduction was held in Kobe, Japan. About 4,000 participants from 168 states, 78 observer organizations from the UN and other inter-governmental organizations, 161 NGOs and 154 media organizations attended the conference.

The broad objective of the conference was building the resilience of nations and communities to substantially reduce the losses in lives and social, economic and environmental assets of communities.

The specific objectives were:

- Conclude the review of the Yokohama Strategy and Plan of Action with a view to updating the guiding framework on disaster reduction for the 21st century;
- Identify specific activities aimed at ensuring the implementation of relevant provisions of the Johannesburg Plan of Implementation (JPOI), adopted in 2002 at the World Summit on Sustainable Development (WSSD);
- Share best practices and lessons learned to support and facilitate disaster reduction within the context of attaining sustainable development, and identify gaps and challenges;
- Increase awareness of the importance of disaster reduction policies to facilitate and promote the implementation of those policies; and
- Increase the reliability and availability of appropriate disaster-related information to the public and disaster management agencies in all regions, as set out in the relevant provisions of the JPOI.

The conference produced a 10 year Framework document called “Hyogo Framework for Action 2005-2015: Building the resilience of nations and communities. The HFA commits:

- To pursue an integrated multi-hazard approach for sustainable development to reduce the incidence and severity of disasters;
- To place disaster risk at the center of our political priorities and policies;
- To integrate disaster risk reduction in all our development work;

- To strengthen the capacity of disaster-prone countries to address risk;
- To invest substantively in disaster preparedness;
- To reduce the relief-development gap and thereby reduce vulnerability;
- To enable civil society actors and affected communities to strengthen their resilience to disasters
- To reduce the gap between what we know and what we do, with the critical ingredient being political commitment; and
- To build on the momentum of this World Conference to accelerate implementation of the Framework for Action.

Priorities for action

Drawing on the conclusions of the review of the Yokohama Strategy, and on the basis of deliberations at the Conference and especially the agreed expected outcome and strategic goals, the World Conference on Disaster Reduction adopted the following five priorities for action:

1. Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation

Countries that develop policy, legislative and institutional frameworks for disaster risk reduction and that are able to develop and track progress through specific and measurable indicators have greater capacity to manage risks and to achieve widespread consensus for, engagement in and compliance with disaster risk reduction measures across all sectors of society.

2. Identify, assess and monitor disaster risks and enhance early warning

The starting point for reducing disaster risk and for promoting a culture of disaster resilience lies in the knowledge of the hazards and the physical, social, economic and environmental vulnerabilities to disasters that most societies face, and of the ways in which hazards and vulnerabilities are changing in the short and long term, followed by action taken on the basis of that knowledge.

3. Use knowledge, innovation and education to build a culture of safety and resilience at all levels

Disasters can be substantially reduced if people are well informed and motivated towards a culture of disaster prevention and resilience, which in turn requires the collection, compilation and dissemination of relevant knowledge and information on hazards, vulnerabilities and capacities.

4. Reduce the underlying risk factors

Disaster risks related to changing social, economic, environmental conditions and land use, and the impact of hazards associated with geological events, weather, water, climate variability and climate change are addressed in sector development planning and programmes as well as in post-disaster situations.

5. Strengthen disaster preparedness for effective response at all levels

At times of disaster, impacts and losses can be substantially reduced if authorities, individuals and communities in hazard-prone areas are well-prepared and ready to act and are equipped with the knowledge and capacities for effective disaster management.

4.5 UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE (UNFCCC)

Climate change is rapidly emerging as one of the most serious threats that humanity may ever face. Global warming threatens the development goals for billions of the world's poorest people. We face a genuine danger that recent gains in poverty reduction will be thrown into reverse in coming decades, particularly for the poorest communities.

The Convention on Climate Change sets an overall framework for intergovernmental efforts to tackle the challenge posed by climate change. It recognizes that the climate system is a shared resource whose stability can be affected by industrial and other emissions of carbon dioxide and other greenhouse gases. The Convention enjoys near universal membership, with 189 countries having ratified.

Under the Convention, governments:

Gather and share information on greenhouse gas emissions, national policies and best practices

Launch national strategies for addressing greenhouse gas emissions and adapting to expected impacts, including the provision of financial and technological support to developing countries

Cooperate in preparing for adaptation to the impacts of climate change

The Convention entered into force on 21 March 1994.

4.5.1 National Adaptation Programmes of Action (NAPA)

As an outcome of the climate change convention, National Adaptation Programmes of Action (NAPAs) provides a process for Least Developed Countries to identify priority activities that respond to their urgent and immediate needs with regard to adaptation to climate change. Bangladesh was among the first countries to prepare and submit its NAPA with the UNFCCC Secretariat in November 2005. The Climate Change Cell has a mandate to continue the NAPA process and facilitate implementation of NAPA. Some of the projects proposed in NAPA need to start without delay to provide vital feedback to the relevant implementing agencies and potential donors for long-term planning. Adaptation Measures as prioritized in Bangladesh NAPA are as follows:

Adaptation Measures as Prioritized in Bangladesh NAPA

Intervention measures

* Promoting adaptation to coastal crop agriculture to combat salinity intrusion through maize production under Wet Bed No-tillage Method and *Sorjan* systems of cropping in tidally flooded agro ecosystem.
* Adaptation to agriculture systems in areas prone to enhanced flash flooding in the North East and Central Region through no-tillage potato cultivation under water hyacinth mulch in wet sown condition, and vegetable cultivation on floating beds.
* Promoting adaptation to coastal fisheries through culture of salt-tolerant fish especially in coastal areas of Bangladesh.
* Adaptation to fisheries in areas prone to enhanced flooding in North East and Central Region through adaptive and diversified fish culture practices.

* Construction of flood shelter, and information and assistance centre to cope with enhanced recurrent floods in major floodplains.
* Reduction of climate change hazards through coastal afforestation with community focus.
* Providing drinking water to coastal communities to combat enhanced salinity due to sea level rise.
* Enhancing resilience of urban infrastructure and industries to impacts of climate change including floods and cyclone.

Facilitating measures

* Capacity building for integrating Climate Change in planning, designing of infrastructure, conflict management and land water zoning for water management institutions.
* Exploring options for insurance and other emergency preparedness measures to cope with enhanced climatic disasters (e. g. flood, cyclones and drought).
* Mainstreaming adaptation to climate change into policies and programmes in different sectors (focusing on disaster management, water, agriculture, health and industry).
* Inclusion of climate change issues in curriculum at secondary and tertiary educational institution.

4.6 SAARC FRAMEWORK FOR ACTION (SFA) 2006-2015

The Heads of State or Governments in the 13th Dhaka Summit called for elaboration of a Comprehensive Framework on Early Warning and Disaster Management. In view of the December 2004 Asia Tsunami and the 2005 Pakistan Earthquake, the Heads of State or Governments underscored the urgency to put in place a regional response mechanism dedicated to disaster preparedness, emergency relief and rehabilitation to ensure immediate response. They directed the concerned national authorities to coordinate their activities in the areas of disaster management such as early warning, exchange of information, training and sharing of experiences and best practices in emergency relief efforts.

Following the Dhaka Declaration, a SAARC (South Asian Association for Regional Cooperation) Expert Group was formed to formulate a regional comprehensive framework on disaster management for the SAARC region. The expert group met in Dhaka on 7-9 February 2006. As per the mandate of the Meeting and taking into account the deliberations of the Meeting, Bangladesh circulated a draft Comprehensive Framework on Disaster Management titled “Disaster Management in South Asia: A Comprehensive Regional Framework for Action 2006-2015”, for consideration. After detailed discussions and amendments, the Framework was adopted in the meeting.

Strategic Goals of the framework include the following:

- Professionalizing the disaster management system;
- Mainstreaming disaster risk reduction;
- Strengthening of community institutional mechanisms;
- Empowering community at risk particularly women, the poor and the disadvantaged;
- Expanding risk reduction programming across a broader range of hazards (all hazards approach);
- Strengthening emergency response systems; and
- Developing and strengthening networks of relevant national, regional and international organizations.

The SFA identifies the following as the priority areas for action:

- Develop and implement risk reduction strategies
- Establish Regional and National Response Mechanisms

- Establish a Regional Information Sharing Mechanism and Develop Network of Institutions and Organizations
- Develop and implement Disaster Management training, education, research and awareness programmes
- Apply the ICT for disaster management.
- Establish an effective monitoring and evaluation mechanism.

For implementation and follow up of the SFA, it has been emphasized that:

- The strategic goals and priorities for action should be addressed by different stakeholders in a multi-sectoral approach, including the development sector.
- Member States and regional organizations will integrate disaster risk reduction considerations into their sustainable development policy, planning and programming at all levels.
- Civil society, including volunteers and community-based organizations, the scientific community and the private sector are vital stakeholders in supporting the implementation of disaster risk reduction at all levels.
- While each Member State has primary responsibility for its own economic and social development, an enabling regional environment is vital to stimulate and contribute to developing the knowledge, capacities and motivation needed to build disaster resilient nations and communities.
- All the Member States will be encouraged to apply a holistic approach and maintain consistency in programming and building multi-stakeholder partnerships at all levels, as appropriate, to contribute to the implementation of this Framework for Action.
- Member States and other actors are encouraged to promote the strengthening or establishment of volunteer corps, which can be made available during disasters.
- Member countries shall develop their own plan of action for implementation of this framework.

The draft SFA was placed before the SAARC Environment Ministers' Meeting held in Dhaka from 22-24 May 2006. The Meeting endorsed the SFA and urged the member states to prepare their own plans of actions for implementation of the SAARC framework and forward to the SAARC Secretariat by December 2006. This National Plan is an outcome of the SAARC process.

4.7 BANGLADESH CLIMATE CHANGE STRATEGY AND ACTION PLAN 2009

The Government of Bangladesh's Vision is to eradicate poverty and achieve economic and social wellbeing for all the people. This will be achieved through a pro-poor **Climate Change Strategy,** which prioritizes adaptation and disaster risk reduction, and also addresses low carbon development, mitigation, technology transfer and the provision of adequate finance. Accordingly Government has developed and enacted Bangladesh Climate Change Strategy and Action Plan (BCCSAP) 2009.

The BCCSAP is presented in two parts. The first part provides the background based on physical and climatic contexts, core socio-economic realities and policies in the country and the consequent rationale for a strategy on climate change. The thrust of the strategy is on sustainable development, poverty reduction and increased wellbeing of all vulnerable groups in society with special emphasis on gender sensitivity. The second part elaborates a set of programmes based upon six pillars or broad areas of intervention (not necessarily mutually exclusive) that have been elaborated in the first part. The BCCSAP sums up Bangladesh's current thinking on desirable activities to build climate resilience into the economy and society of Bangladesh through adaptation to climate change as well as mitigation for a low carbon development path. BCCSAP provides the context, outline the implications and likely impacts of climate change in Bangladesh, an overview of different adaptation strategies and briefly outline mitigation issues.

It also describes a ten-year programme to build the capacity and resilience of the country to meet the challenge of climate change over the next 20-25 years. Following are the thematic areas:

1. **Food security, social protection and health** to ensure that the poorest and most vulnerable in society, including women and children, are protected from climate change and that all programmes focus on the needs of this group for food security, safe housing, employment and access to basic services, including health.
2. **Comprehensive disaster management** to further strengthen the country's already proven disaster management systems to deal with increasingly frequent and severe natural calamities.
3. **Infrastructure** to ensure that existing assets (e.g., coastal and river embankments) are well maintained and fit-for-purpose and that urgently needed infrastructure (e.g. cyclone shelters and urban drainage) is put in place to deal with the likely impacts of climate change.
4. **Research and knowledge management** to predict the likely scale and timing of climate change impacts on different sectors of the economy and socio-economic groups; to underpin future investment strategies; and to ensure that Bangladesh is networked into the latest global thinking on climate change.
5. **Mitigation and low carbon development** to evolve low carbon development options and implement these as the country's economy grows over the coming decades.
6. **Capacity building and institutional strengthening** to enhance the capacity of government ministries and agencies, civil society and the private sector to meet the challenge of climate change.

The strategy mentions Environment and Forests and its agencies (e.g. the Department of Environment, DoE. and Department of Forests, DoF); Food and Disaster Management (DM&RD), which includes the Disaster Management Bureau (DMB) and the Comprehensive Disaster Management Programme (CDMP); Water Resources, which includes the Bangladesh Water Development Board and other research and forecasting organizations; Local Government, Rural Development and Cooperatives, which includes the Local Government Engineering Department (LGED) and the Department of Public Health Engineering (DPHE); Agriculture, including the National Agricultural Research System, which develops new crops and practices suited to different climatic and salinity conditions in the country; Livestock and Fisheries; Energy; and Health as the main Government of Bangladesh ministries involved in climate change and specifies roles and responsibilities. Accordingly NDMP proposes actions in the matrix provided.

Programmes funded under the Action Plan will be implemented by line ministries and agencies, with participation, as appropriate, of other stakeholder groups, including civil society, professional and research bodies and the private sector. A National Steering Committee on Climate Change chaired by state minister for Environment and forest has been established to coordinate and facilitate national actions on climate change and reports to the National Environment Committee, chaired by the Prime Minister. A Climate Change Unit will be set up in the Ministry of Environment and Forests, to support the National Steering Committee on Climate Change. It will work with climate change cells in all ministries.

5. METHODS OF PLAN DEVELOPMENT

After the approval of the SFA at the SAARC Council of Ministers' Meeting held in Dhaka on 1 August 2006, the Ministry of Foreign Affairs requested DM&RD to urgently prepare the National Plan. Accordingly, the DM&RD formed a committee (Annex 1) to recommend a draft national plan. Several versions of the draft were prepared and consulted. With comments and suggestions from various ministries and departments, the version five was prepared and placed before the Inter-Ministerial Disaster Management Coordination Committee (IMDMCC) on 22 February 2007. In light of the discussions and decisions of the IMDMCC, the draft was further revised and was prepared. Finally, the draft national plan will be placed before a wider group comprising government and non-government organizations and academic institutions. With the

feedback from this wider group, the draft national plan version should be prepared and submitted to the DM&RD, which circulated it for comments and suggestions from relevant ministries and departments for consideration of the Cabinet.

6. OBJECTIVES OF THE PLAN

The objectives of this Plan are to:

- Align the strategic direction of disaster management programs with national priorities and international commitments.
- Articulate the vision and goals for disaster management.
- Outline the strategic direction and priorities to guide the design and implementation of disaster management policies and programs.
- Create a cohesive and well-coordinated programming framework incorporating government, non-government and private sector.
- Ensure that disaster management has a comprehensive and all-hazards focus comprising disaster risk reduction and emergency response.
- Illustrate to other ministries, NGOs, civil society and the private sector how their work can contribute to the achievements of the strategic goals and government vision on disaster management.

6.1 CORE PRINCIPLES

The core principles of this plan have been adopted from the PRSP.

- Country-driven, promoting national ownership of strategies through broad based participation of government, NGOs and civil society.
- Result oriented and focused on outcomes that will benefit vulnerable communities, especially women, the poor and socially disadvantaged.
- Comprehensive in recognizing the multidimensional nature of risk reduction.
- Partnership oriented, involving coordinated participation of development partners (government, domestic stakeholders, and external donors)
- Based on a long-term perspective for risk reduction.

7. STRATEGIC GOALS OF THE PLAN

The strategic goals of the plan are drawn from the SAARC Disaster Management Framework.

GOAL 1: PROFESSIONALISING THE DISASTER MANAGEMENT SYSTEM

GOAL 2: MAINSTREAMING RISK REDUCTION

GOAL3: STRENGTHENING INSTITUTIONAL MECHANISMS

GOAL 4: EMPOWERING AT RISK COMMUNITIES

GOAL 5: EXPANDING RISK REDUCTION PROGRAMMING

GOAL 6: STRENGTHENING EMERGENCY RESPONSE SYSTEMS

GOAL 7: DEVELOPING AND STRENGTHENING NETWORKS

The linkages of the key strategic goals to key international and national drivers for change are presented in Annex 6.

8. CONCEPTUALIZING DISASTER MANAGEMENT IN BANGLADESH

8.1 DISASTER MANAGEMENT MODEL

Bangladesh has created a simplistic model to guide disaster risk reduction and emergency response management efforts in Bangladesh. The model (Figure 14) has three key elements and ensures that the move to a more comprehensive risk reduction culture remains central to all efforts.

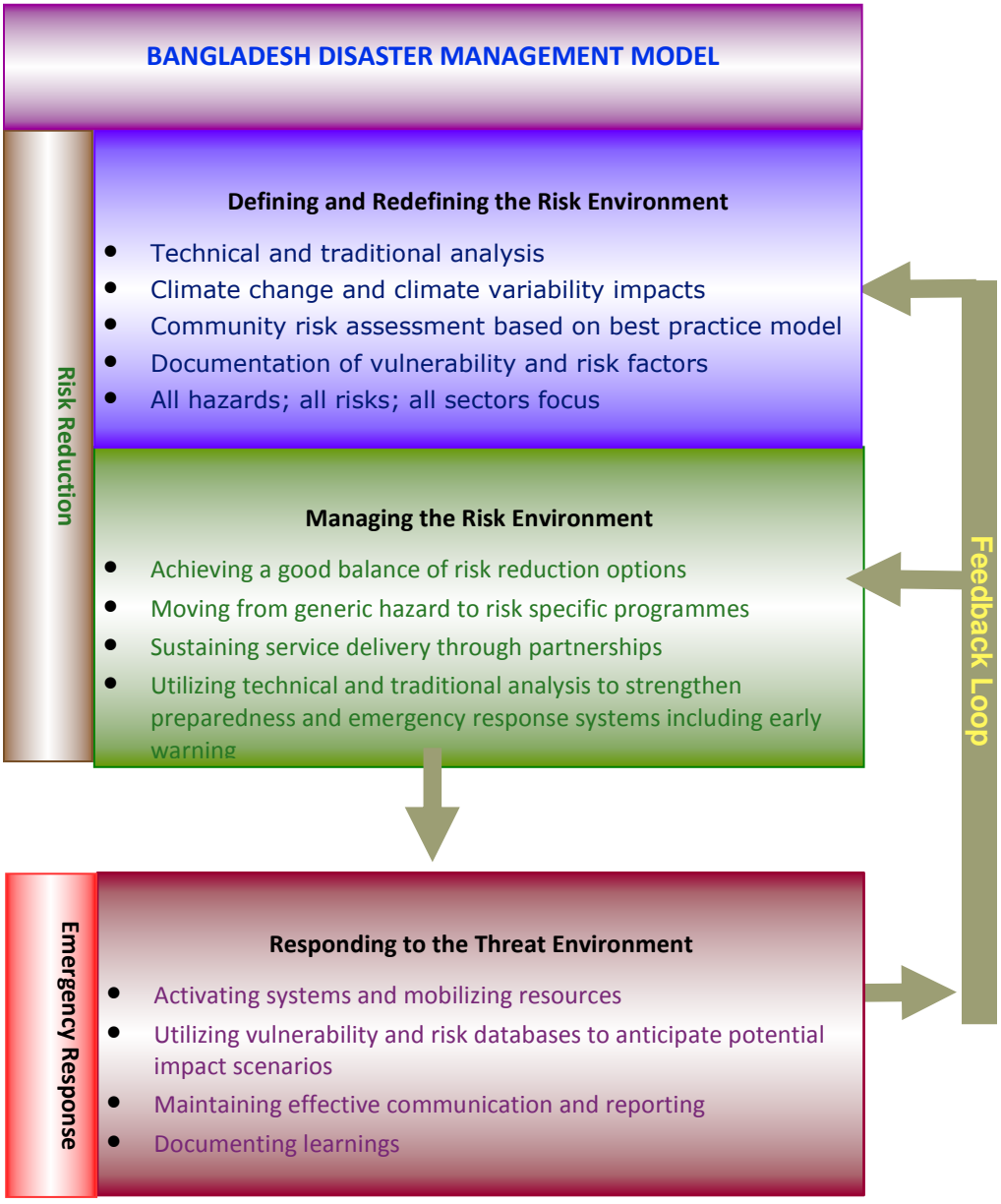


Figure 14: Disaster Management Model

8.1.1 Defining and redefining the risk environment

This element of the model promotes the use of scientific analysis (including climate change impacts) as the basis for accurately determining the future risk environment relative to all hazards, all sectors and all geographical areas.

To develop actions for managing risk (risk treatment options) the risk environment must first be defined. Defining the risk environment creates knowledge of the interaction of hazard and the elements at risk (community) and is conducted in a structured and analytical process. Defining the risk environment involves both the traditional and formal hazard analysis, and includes the following steps:

- Understanding the social, political and community environment (Establishing the context)
- Establishing what are the likely threats (Identifying hazards and risks)
- Understanding the likelihood and consequences (Analyze the risks)
- Rank risks in priority (Evaluate risks)
- What can be done to eliminate, reduce or manage risk (Identify risk treatment strategies).

8.1.1.1. Hazard Analysis

Hazard Assessment is the process of identification of events that lead to harm or loss. It may be undertaken using traditional or formal methods, and should consider both primary hazards (e.g. cyclone) and secondary hazards (e.g. storm surge, wind, rain). Hazards may be represented using GIS and modern mapping methodologies, and must include details of the effects to communities of the hazard.

8.1.1.2. Vulnerability Assessment

In order to understand the interaction of hazards on communities, it is important to conduct a vulnerability assessment. This should be completed in terms of elements within the community (e.g. women, children, and the poor), support elements to the community (e.g. lifelines (electricity) transportation links, community services) and livelihood factors within the community (e.g. food, accommodation, farm activity, industry)

8.1.1.3. Risk Treatment

Risk Treatment options involve ranking risk in priority, and addressing vulnerability by determining actions that reduce or eliminate risk or by determining mitigation programs for communities.

8.1.2 Managing the risk environment

This element of the model promotes the design of risk reduction strategies (Community Based Adaptation Programmes) as an outcome of the risk assessment process. This ensures Prevention, Preparedness, Response and Recovery programmes are multi hazard focused and that the move from being hazard generic in nature to risk specific. This will enable communities to better understand their changing risk environment and thus become more resilient through proactive risk reduction efforts.

Managing the risk environment involves developing programs and strategies that eliminate, or reduce the level of risk. Traditionally mitigation programs were viewed as engineering solutions to eliminate risk, but it is now accepted that all activities undertaken to eliminate or reduce risk are "mitigation" strategies (e.g. community education and awareness, planning activities, development of warning systems). This includes activities previously described as the PPRR Model – Prevention, Preparedness, Response and Recovery. Activities in developing response or recovery systems are included as legitimate mitigation activities.

8.1.3 Responding to the threat environment

This element of the model involves responding to an actual threat situation. It helps Bangladesh disaster management officials to clearly articulate the difference between risk reduction and emergency response and how accurately defining risk environments can influence and enhance emergency response systems and decisions.

Not all hazards can be managed and not all risks can be eliminated or minimized. At times a response to an emerging threat or an event that has happened will be necessary. In this case, response and recovery systems that have been developed in managing the risk environment are activated as needed to respond to the threat. Such response may include:

- Warning Period (Alert and activation).
- Hazard Onset (Response), and.
- Post Hazard Period (Relief, early recovery and Rehabilitation).

The key attributes of the model are:

- It provides a framework to guide the achievement of the Hyogo Framework for Action commitments.
- It clearly articulates the key elements of disaster management and their interactive relationships.
- It facilitates the transition from generic hazard based to specific risk based programmes through the inclusion of technical inputs.
- It provides guidance for the design of policy, planning and training.
- It provides a mechanism to achieve consistency in process and methodology.
- It ensures preparedness and response strategies are influenced by technical and traditional considerations.

8.2 MAINSTREAMING RISK REDUCTION – THE STRATEGIES

Mainstreaming risk reduction efforts within government, NGOs and private sector is viewed as being the key to achieving sustainable all hazards risk reduction interventions across the whole country. In Bangladesh mainstreaming is seen in much the same light as poverty reduction in that it is the outcome of many top down and bottom up interventions. These are summarized below and articulated briefly within Figure 15.

8.2.1 Advocacy: Awareness raising among Political, Senior Policy and Government Department Officials, Media and Academic Institutions is a priority strategy for building knowledge and understanding on the benefits of risk reduction and the roles these organizations play in implementing risk reduction programmes.

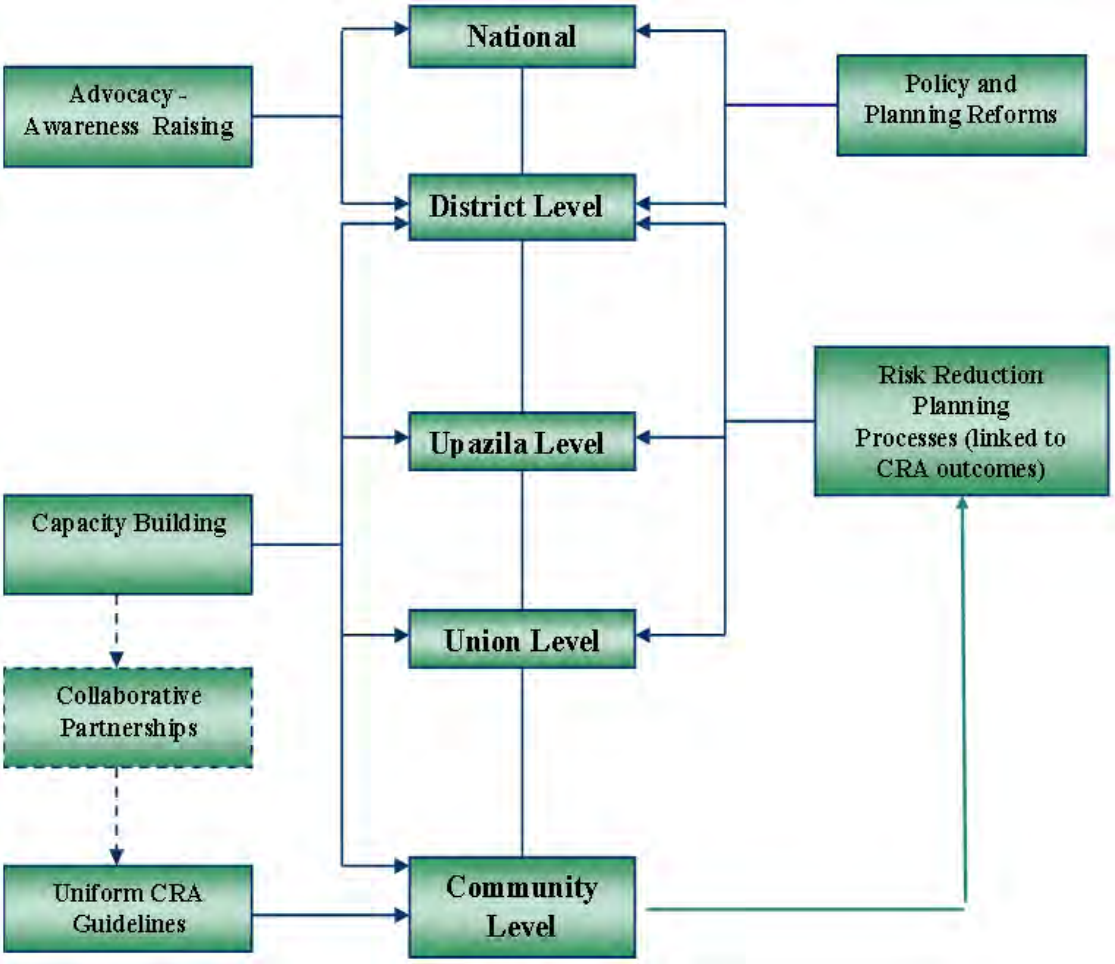
8.2.2 Policy and Planning Reform: A significant review of disaster management and development planning policy is being undertaken to ensure that they facilitate mainstreaming and promote a comprehensive risk reduction culture.

8.2.3 **Capacity Building:** This strategy has targeted a complete review of the roles and responsibilities of disaster management committees (DMCs) at all levels to ensure they reflect risk reduction as well as emergency response functions. A national training curriculum is being developed to ensure that committees receive capacity building training to ensure they understand and can fulfill their functions effectively.

8.2.4 **Planning Frameworks**: Disaster management planning at all levels is being significantly overhauled to ensure that DMC plans accommodate risk reduction mainstreaming at all levels.

8.2.5 **Uniform CRA Guidelines:** Uniform CRA processes are being established to ensure consistency in the conduct of community risk identification and compatibility with the risk reduction planning processes of the respective DMCs. The guidelines also have steps to ensure strong linkages with scientific analysis information.

Figure 15: Mainstreaming strategies



9. DISASTER MANAGEMENT SYSTEM IN BANGLADESH

The Disaster Management and Relief Division (DM&RD), MoFDM of the Government of Bangladesh has the responsibility for coordinating national disaster management efforts across all agencies. In January 1997 the Ministry issued the Standing Orders on Disaster (SOD) to guide and monitor disaster management activities in Bangladesh.

The SOD have been prepared with the avowed objective of making the concerned persons understand their duties and responsibilities regarding disaster management at all levels, and accomplishing them. All Ministries, Divisions/Departments and Agencies shall prepare their own Action Plans in respect of their responsibilities under the Standing Orders for efficient implementation. The National Disaster Management Council (NDMC) and Inter-Ministerial Disaster Management Coordination Committee (IMDMCC) will ensure coordination of disaster related activities at the National level. Coordination at District, Thana and Union levels will be done by the respective District, Thana and Union Disaster Management Committees. The Disaster Management Bureau will render all assistance to them by facilitating the process.

A series of inter-related institutions, at both national and sub-national levels (Figure 16) have been created to ensure effective planning and coordination of disaster risk reduction and emergency response management.

At the national level

1. National Disaster Management Council (NDMC) headed by the Honourable Prime Minister to formulate and review the disaster management policies and issue directives to all concerns.
2. Inter-Ministerial Disaster Management Co-ordination Committee (IMDMCC) headed by the Hon'ble Minister in charge of the Disaster Management and Relief Division (DM&RD) to implement disaster management policies and decisions of NDMC / Government.
3. National Disaster Management Advisory Committee (NDMAC) headed by an experienced person having been nominated by the Honourable Prime Minister.
4. National Platform for Disaster Risk Reduction (NPDRR) headed by Secretary, DM&RD and DG, DMB functions as the member secretary. This platform shall coordinate and provide necessary facilitation to the relevant stakeholders.
5. Earthquake Preparedness and Awareness Committee (EPAC) headed by Honourable minister for MoFDM and DG, DMB act as member secretary
6. Vi. Cyclone Preparedness Program Implementation Board (CPPIB) headed by the Secretary, Disaster Management and Relief Division to review the preparedness activities in the face of initial stage of an impending cyclone.
7. Cyclone Preparedness Programme (CPP) Policy Committee headed by Honourable Minister, MoFDM and Secretary, DM&RD act as member secretary. Disaster Management Training and Public Awareness Building Task Force (DMTATF) headed by the Director General of Disaster Management Bureau (DMB) to coordinate the disaster related training and public awareness activities of the Government, NGOs and other organizations.
8. Focal Point Operation Coordination Group of Disaster Management (FPOCG) headed by the Director General of DMB to review and coordinate the activities of various

departments/agencies related to disaster management and also to review the Contingency Plan prepared by concerned departments.

9. NGO Coordination Committee on Disaster Management (NGOCC) headed by the Director General of DMB to review and coordinate the activities of concerned NGOs in the country.
10. Committee for Speedy Dissemination of Disaster Related Warning/ Signals (CSDDWS) headed by the Director General of DMB to examine, ensure and find out the ways and means for the speedy dissemination of warning/ signals among the people.

At sub-national levels

1. District Disaster Management Committee (DDMC) headed by the Deputy Commissioner (DC) to coordinate and review the disaster management activities at the District level.
2. Upazila Disaster Management Committee (UZDMC) headed by the Upazila Nirbahi Officer (UNO) to coordinate and review the disaster management activities at the Upazila level.
3. Union Disaster Management Committee (UDMC) headed by the Chairman of the Union Parishad to coordinate, review and implement the disaster management activities of the concerned Union.
4. Pourashava Disaster Management Committee (PDMC) headed by Chairman of Pourashava (municipality) to coordinate, review and implement the disaster management activities within its area of jurisdiction.
5. City Corporation Disaster Management Committee (CCDMC) headed by the Mayor of City Corporations to coordinate, review and implement the disaster management activities within its area of jurisdiction.

Disaster Management Institutions in Bangladesh

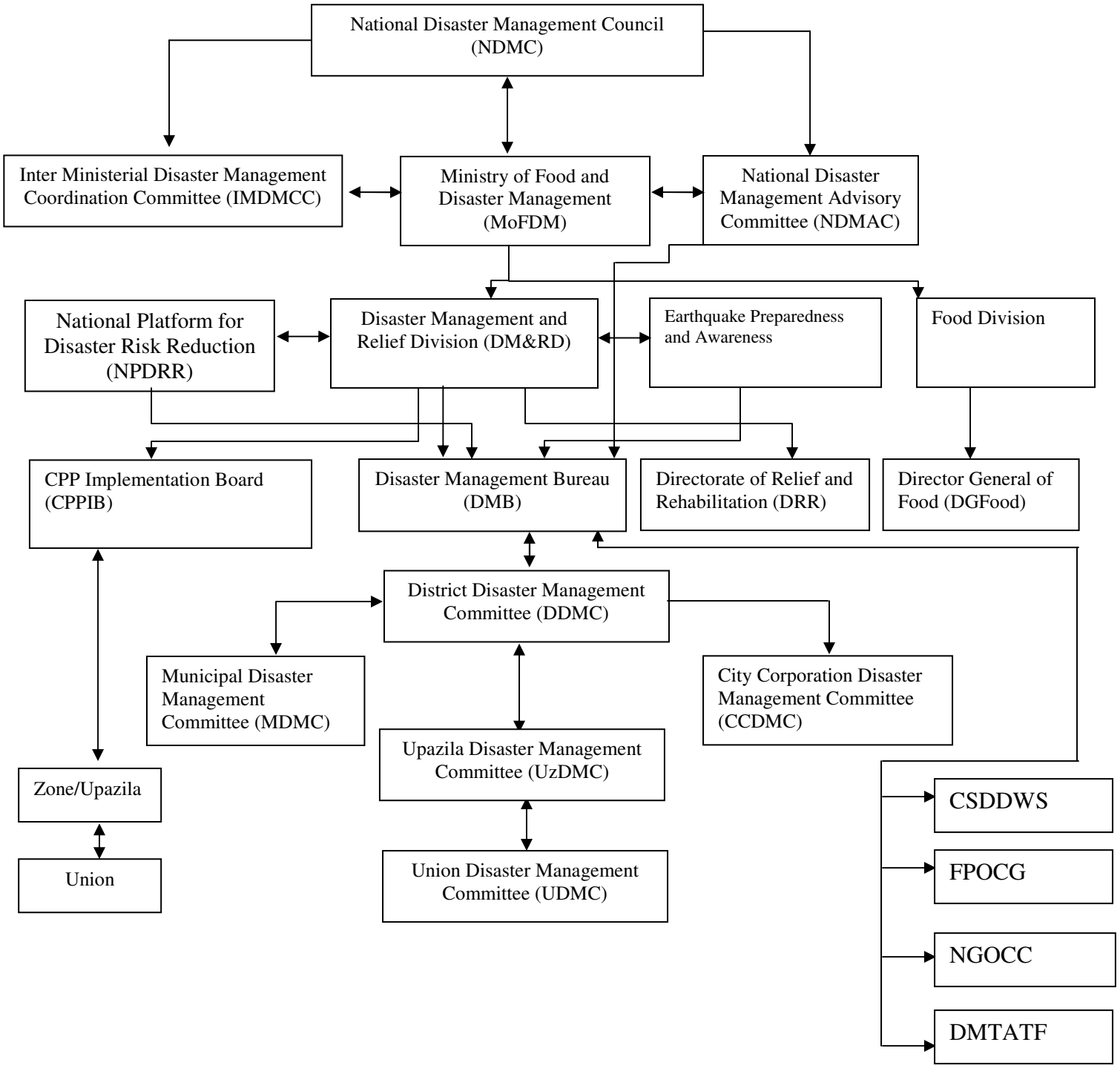


Figure 16: Disaster Management Institutions in Bangladesh

*Detailed roles and responsibilities of all entities are outlined in the Standing Orders on Disaster.

10. DISASTER MANAGEMENT REGULATORY FRAMEWORK

Bangladesh's regulative framework for disaster management provides for the relevant legislative, policy and best practice framework under which the activity of Disaster Risk Reduction and Emergency Management in Bangladesh is managed and implemented. The framework includes:

10.1 Disaster Management Act

A Disaster Management Act will be enacted with a view to create the legislative tool under which disaster risk and emergency management will be undertaken in Bangladesh, and the legal basis in which activities and actions will be managed. It will also create mandatory obligations and responsibilities on Ministries, committees and appointments. The objectives of the Act will be a) To help communities to mitigate the potential adverse effects of hazard events, prepare for managing the effects of a disaster event, effectively respond to and recover from a disaster or an emergency situation, and adapt to adverse effects of climate change; b) To provide for effective disaster management for Bangladesh; c) To establish an institutional framework for disaster management; and d) To establish risk reduction as a core element of disaster management.

10.2 National Disaster Management Policy

A National Disaster Management Policy will be formulated to define the national perspective on disaster risk reduction and emergency management, and to describe the strategic framework, and national principles of disaster management in Bangladesh. It will be of strategic in nature and will describe the broad national objectives, and strategies in disaster management.

10.3 Disaster Management Plans

The Bangladesh National Plan for Disaster Management is a strategic document to be effective for a certain period of time. This is an umbrella plan that provides the overall guideline for the relevant sectors and the disaster management committees at all levels to prepare and implement their area of roles specific plans. The Disaster Management and Relief Division (DM&RD) being the focal ministry for disaster risk reduction and emergency management will take the lead role in disaster risk reduction and emergency management planning. Additionally, there will be a few hazard specific management plans, such as Flood Management Plan, Cyclone and Storm Surge and Tsunami Management Plan, Earthquake Management Plan, Drought Management Plan, River Erosion Management Plan, etc. Moreover, there will be a detailed Disaster Management Plan for each District, Upazila, Union and Pourashava and City Corporation of the country. A District Disaster Management Plan will be the compilation of the Upazila Disaster Management Plans of the District. Similarly an Upazila Disaster Management Plan will be the compilation of the union disaster management plans of that Upazila prepared by the Union DMCs. So DMCs at Union and Pourashava levels will be mainly responsible for conducting the risk assessments and prepare the ground level plans. Once developed those will be sent to the DMCs at one level higher – Upazila DMCs, whose role will be to verify and compile the union plans and identify the resource requirements for the Upazila.

10.4. Standing Orders on Disaster

The Standing Orders on Disaster describes the detailed roles and responsibilities of committees, Ministries and other organizations in disaster risk reduction and emergency management, and establishes the necessary actions required in implementing Bangladesh's Disaster Management Model. The Standing Orders have been prepared with the avowed objective of making the

concerned persons understand their duties and responsibilities regarding disaster management at all levels, and accomplishing them. All Ministries, Divisions/Departments and Agencies shall prepare their own Action Plans in respect of their responsibilities under the Standing Orders for efficient implementation. The National Disaster Management Council (NDMC) and Inter-Ministerial Disaster Management Coordination Committee (IMDMCC) will ensure coordination of disaster related activities at the National level. Coordination at District, Thana and Union levels will be done by the respective District, Thana and Union Disaster Management Committees. The Disaster Management Bureau will render all assistance to them by facilitating the process.

10.5. Guidelines for Government at all Levels (Best Practice Models)

Guidelines for Government at all levels are developed as best practice models, and are used to assist Ministries, NGOs, disaster management committees and civil society in implementing disaster risk management. Guidelines will include, among others:

- Disaster Impact and Risk Assessment Guideline
- Local Disaster Risk Reduction Fund Management Guidelines
- Emergency Fund Management Guidelines
- Indigenous Coping Mechanism Guidebook
- Community Risk Assessment Guidelines
- Damage and Needs Assessment Methodology
- Hazard Specific Risk Assessment Guidelines
- Emergency Response and Information Management Guideline
- Contingency Planning Template
- Sectoral Disaster Risk Reduction Planning Template
- Local Level Planning Template
- National Risk Reduction Fund Management Guideline
- National Disaster Reduction and Emergency Fund Management Guideline
- Local Disaster Management Fund Guideline
- Guideline for Road and Water Safety
- Guideline for Industrial Safety
- Guideline for Disaster Shelter Management
- Monitoring and Evaluation Guideline for the Implementation of the Plan
- Guideline for International Assistance in Disaster Emergency

Figure 17 shows the inter-linkages between various regulative instruments and programming for implementation.

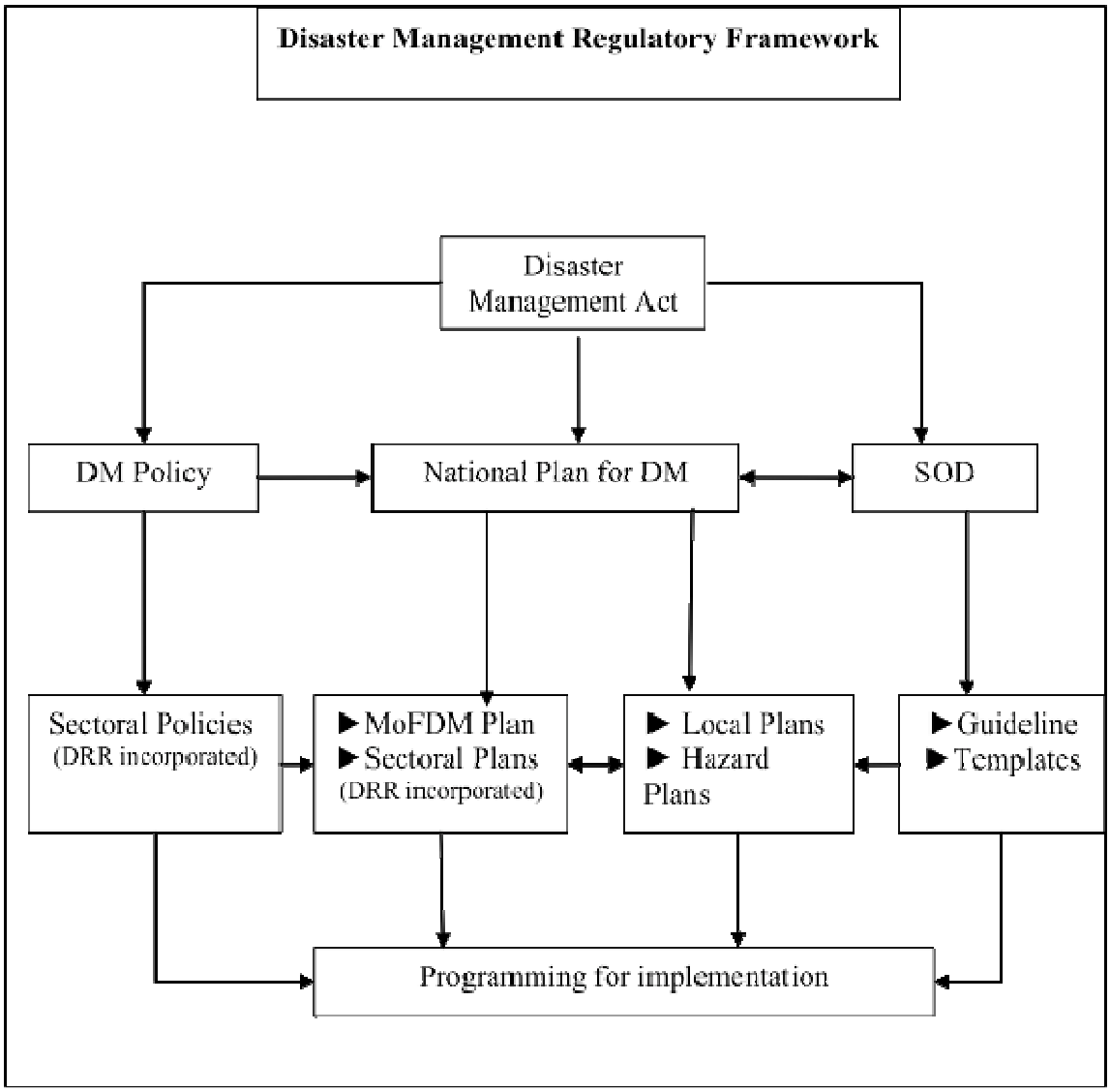


Figure 17: Disaster Management Regulative Framework

11. DISASTER MANAGEMENT PLANS

The disaster management planning framework in Bangladesh is presented below.

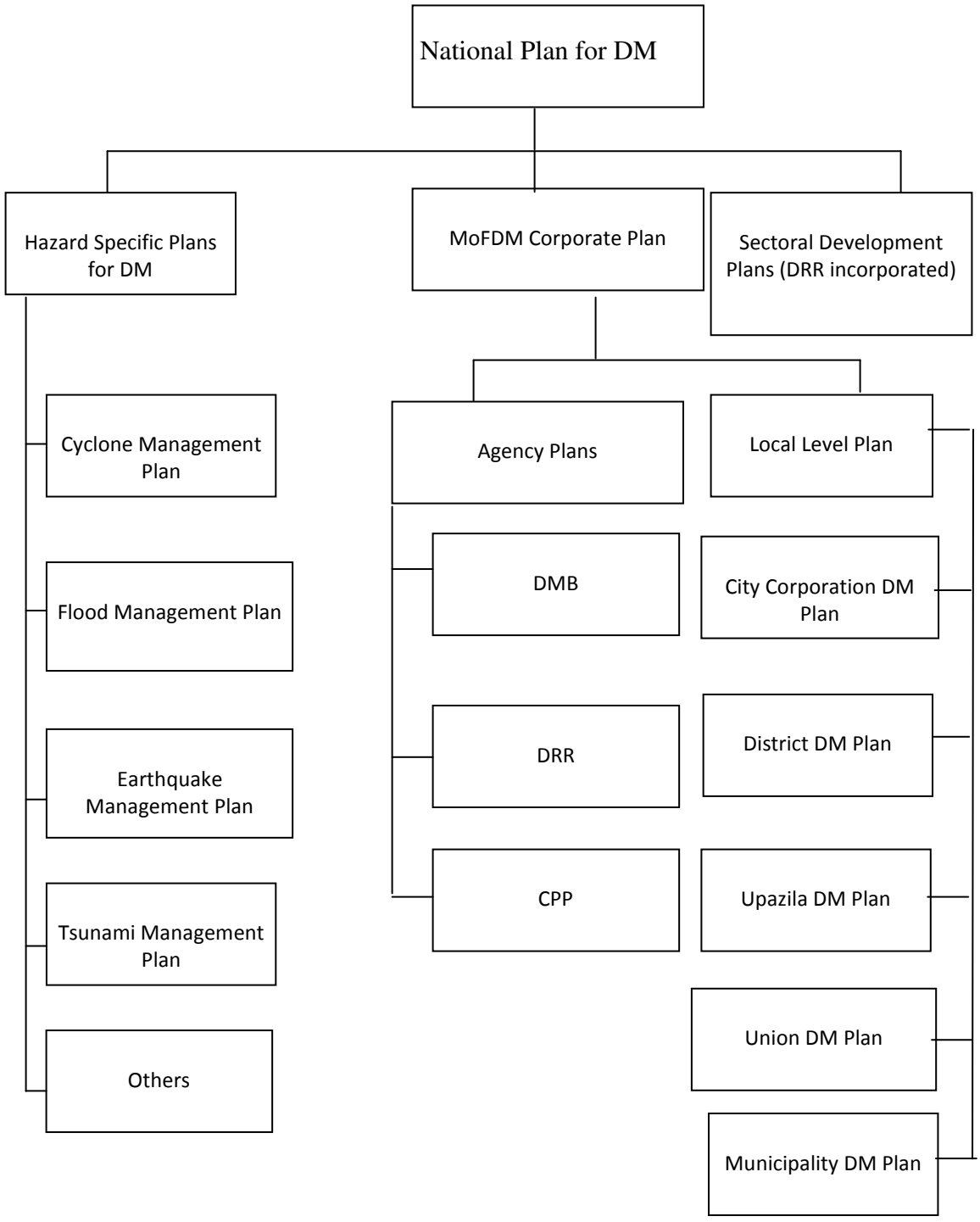


Figure 18: Disaster Management Planning Framework

11. DISASTER MANAGEMENT PLANS

11.1 NATIONAL PLAN FOR DISASTER MANAGEMENT

The National Plan for Disaster Management is prepared by the Disaster Management and Relief Division. The plan includes the following as minimum:

i. Introduction
ii. GoB Vision for Disaster Management
iii. Hazards profile of Bangladesh
iv. Disaster development linkages: national and international drivers for change
v. Aim of the plan
vi. Strategic goals of the plan
vii. Conceptualizing disaster management in Bangladesh
viii. Disaster management system in Bangladesh
ix. The roles and responsibilities of entities involved in emergency operations and risk reduction
x. Disaster management regulative framework
xi. Action matrix for disaster risk reduction and emergency management in Bangladesh describing the priorities and the strategies
xii. Review and evaluation
xiii. Implementation and follow-up
xiv. Financing of the plan
xv. Other matters relating to disaster management as deemed necessary by appropriate authority for inclusion in the plan

The Plan is to be used to:

i. Articulate the long-term strategic focus of disaster management in Bangladesh.
ii. Demonstrate a commitment to address key issues: risk reduction, capacity building, information management, climate change adaptation, livelihood security, issues of gender and the socially disadvantaged, etc.
iii. Show the relationship between the government vision, key result areas, goals and strategies, and to align priorities and strategies with international and national drivers for change.
iv. Detail a road map for the development of disaster management plans by various entities.
v. Guide the DM&RD in the development and delivery of guidelines and programmes.
vi. Illustrate to other ministries, NGOs, civil society and the private sector how their work can contribute to the achievements of the strategic goals and government vision on disaster management.
vii. Provide a framework within which to report performance and success in achieving goals and strategies.

11.2 DISTRICT DISASTER MANAGEMENT PLAN (DDMP)

There is a District Disaster Management Committee (DDMC) at the District level. The DDMC consists of the Deputy Commissioner of the District as the chairperson and members comprising all District level department heads, NGO leaders and civil society members. District Relief and Rehabilitation Officer (DRRO) acts as member secretary of the committee. Members of Parliament act as advisors of the committees. The committee is required to meet bi-monthly during normal period and as and when necessary during emergency situation.

There will be a plan for each District titled "District Disaster Management Plan" comprising both disaster risk reduction and emergency response to be prepared by the District Disaster Management Committee. This is a plan to be prepared by compilation of the Upazila and Pourashava Disaster Management Plans of the District being received from the respective Upazila and Pourashava/City Corporation DMCs. The DDMP should highlight and articulate, among others, the following:

a. The areas in the District vulnerable to different forms of hazards and risks.
b. Total resource requirements and the planned action for the District.
    i. To take measures for prevention and mitigation of disasters by government agencies, NGOs, CBOs and the private sector within the District.
    ii. Capacity building and preparedness measures to be taken by government agencies, NGOs, CBOs and the private sector.
    iii. Strengthening emergency response management system plans and procedures in the event of a disaster.
c. The response plans and procedures in the event of a disaster, providing for:
    i. Allocation of responsibilities to the departments of the government at District level and other DMC members
    ii. Procedure for mobilization of resources
    iii. Prompt response to disaster and relief thereof
    iv. Procurement of emergency supplies
    v. Operation of disaster shelters
    vi. Restoration of emergency services, such as water supply, gas supply, power, telecommunication, road links
    vii. Provision of emergency medical services
    viii. Burial of dead bodies
    ix. Trauma counseling
    x. The dissemination of information

d. Recovery plans and procedures delineating damage assessment procedure, restoration of damaged public infrastructure, resumption of educational institutions, restoration of livelihood, rehabilitation of affected people, especially the disabled, and elderly women and children.
e. The DDMP shall be reviewed and updated annually.
f. The copies of the DDMP shall be made available to all District level stakeholders, Divisional Commissioners, etc.
g. A copy of the DDMP will be sent to the Disaster Management Bureau and all relevant ministries and divisions.
h. The DMB/NDMTI will provide technical advice and capacity building services to all DMCs.

11.3 UPAZILA DISASTER MANAGEMENT PLAN (UzDMP)

Upazila is an important and vital administrative unit of Bangladesh. There is an Upazila Disaster Management Committee (UZDMC) at the Upazila level. The UzDMC consists of the Upazila Nirbahi Officer as the chairperson and members comprising all Upazila level department heads, NGO leaders and civil society members. The PIO acts as the member secretary of the committee. Members of Parliament act as advisors of the committees. The committee is required to meet bi-monthly during normal period and as and when necessary during emergency situation.

There will be a plan for each Upazila titled "Upazila Disaster Management Plan" comprising both disaster risk reduction and emergency response to be prepared by the Upazila Disaster Management Committee by compiling all the Union Disaster Management Plans of the Upazila being received from the respective Union DMCs of the Upazila. The UzDMP should highlight and articulate, among others, the following:

a. The areas in the Upazila vulnerable to different forms of hazards and risks.
b. Total resource requirements and the planned action for the District.
    i. To take measures for prevention and mitigation of disasters by government agencies, NGOs, CBOs and the private sector within the District.
    ii. Capacity building and preparedness measures to be taken by government agencies, NGOs, CBOs and the private sector.
    iii. Strengthening emergency response management system plans and procedures in the event of a disaster.

c. The response plans and procedures in the event of a disaster, providing for:
    i. Allocation of responsibilities to the departments of the government at District level and other DMC members
    ii. Procedure for mobilization of resources
    iii. Prompt response to disaster and relief thereof
    iv. Procurement of emergency supplies
    v. Operation of disaster shelters
    vi. Restoration of emergency services, such as water supply, gas supply, power, telecommunication, road links
    vii. Provision of emergency medical services
    viii. Burial of dead bodies
    ix. Trauma counseling
    x. The dissemination of information

d. Recovery plans and procedures delineating damage assessment procedure, restoration of damaged public infrastructure, resumption of educational institutions, restoration of livelihood, rehabilitation of affected people, especially the disabled, and elderly women and children.
e. The UzDMP shall be reviewed and updated annually.
f. The copies of the UzDMP shall be made available to all Upazila level stakeholders and members of DDMCs.
g. A copy of the UzDMP will be sent to the District Disaster Management Committee and DMB.
h. The DMB/BIDMTR will provide technical advice and capacity building services to all DMCs.

11.4 UNION DISASTER MANAGEMENT PLAN (UDMP)

Union Parishad is the lowest administrative unit of Bangladesh. There is a Disaster Management Committee at the Union level. The UDMC is chaired by the elected Chairman of the respective Union Parishad. The Union Disaster Management Committee consists of the Union Parishad Chairman as the Chairperson and members comprising all the Government department head at Union level, members of Union Parishad, NGO leaders working in respective union and civil society members. Secretary of the respective Union Parishad acts as the member secretary of the committee. The committee is required to meet bimonthly during normal period and as and when necessary during emergency situation.

There will be a plan for each Union titled "Union Disaster Management Plan" comprising both disaster risk reduction and emergency response to be prepared by the Union Disaster Management Committee following a proper community risk assessment procedure to be provided by DM&RD with the participation of vulnerable groups and the communities. The UDMP should highlight and articulate, among others, the following:

a. Defining and redefining community risks to hazards utilizing both traditional and scientific knowledge.
b. Total resource requirements and the planned action for the District.
    i. To take measures for prevention and mitigation of disasters by government agencies, NGOs, CBOs and the private sector within the District.
    ii. Capacity building and preparedness measures to be taken by government agencies, NGOs, CBOs and the private sector.
    iii. Strengthening emergency response management system plans and procedures in the event of a disaster.

c. The response plans and procedures in the event of a disaster, providing for:
    i. Allocation of responsibilities to the departments of the government at District level and other DMC members
    ii. Procedure for mobilization of resources
    iii. Prompt response to disaster and relief thereof
    iv. Procurement of emergency supplies
    v. Operation of disaster shelters
    vi. Restoration of emergency services, such as water supply, gas supply, power, telecommunication, road links
    vii. Provision of emergency medical services
    viii. Burial of dead bodies
    ix. Trauma counseling
    x. The dissemination of information

d. Recovery plans and procedures delineating damage assessment procedure, restoration of damaged public infrastructure, resumption of educational institutions, restoration of livelihood, rehabilitation of affected people, especially the disabled, and elderly women and children.
e. The UDMP shall be reviewed and updated annually.
f. The copies of the UDMP shall be made available to all Union level stakeholders, UNOs and DCs.
g. A copy of the UDMP will be sent to the Upazila Disaster Management Committee.
h. The DMB/BIDMTR will provide technical advice and capacity building services to all DMCs.

11.5 PAURASHAVA/CITY CORPORATION DISASTER MANAGEMENT PLAN

Pourashava is at the bottom of the urban administrative tier of Bangladesh. There is a Disaster Management Committee at the City Corporation/Pourashava level. The Pourashava Chairman is the head of the committee. The members of the Committee are all Pourashava commissioners, representatives from all the Government departments, NGOs and CBOs. Chief Executive Officer of the Pourashava is the member secretary of the committee. The committee is required to meet monthly during normal period and as and when necessary during emergency situation. Besides, metropolitan cities in Bangladesh have City Corporation Disaster Management Committees with the Mayor as the Chairman and comprising members as it is in case of Pouroshavas.

There will be a plan for each Pourashava/City Corporation titled "Pourashava/City Corporation Disaster Management Plan" to be prepared by the "Pourashava/City Corporation Disaster Management Committee having linkages with the National Plan for Disaster Management. The PDMP/CCDMP should highlight and articulate, among others, the following:

a) The areas in the Pourashava/City Corporation vulnerable to different forms of hazards and risks.
b) Total resource requirements and the planned action for the District.
    i. To take measures for prevention and mitigation of disasters by government agencies, NGOs, CBOs and the private sector within the District.
    ii. Capacity building and preparedness measures to be taken by government agencies, NGOs, CBOs and the private sector.
    iii. Strengthening emergency response management system plans and procedures in the event of a disaster.

c) The response plans and procedures in the event of a disaster, providing for:
    i. Allocation of responsibilities to the departments of the government at District level and other DMC members
    ii. Procedure for mobilization of resources
    iii. Prompt response to disaster and relief thereof
    iv. Procurement of emergency supplies
    v. Operation of disaster shelters
    vi. Restoration of emergency services, such as water supply, gas supply, power, telecommunication, road links
    vii. Provision of emergency medical services
    viii. Burial of dead bodies
    ix. Trauma counselling
    x. The dissemination of information

d) Recovery plans and procedures delineating damage assessment procedure, restoration of damaged public infrastructure, resumption of educational institutions, restoration of livelihood, rehabilitation of affected people, especially the disabled, and elderly women and children.
e) The PDMP shall be reviewed and updated annually.
f) The copies of the PDMP shall be made available to all Pourashava/city corporation level stakeholders, UNOs and DCs.
g) A copy of the PDMP will be sent to the District Disaster Management Committee and Disaster Management Bureau.
h) The DMB/ BIDMTR will provide technical advice and capacity building services to all DMCs.

11.6 SECTORAL DEVELOPMENT PLANS INCORPORATING DISASTER RISK REDUCTION

Every Ministry/Division of the Government of Bangladesh prepares their respective Sectoral Development Plans. DM&RD with the participation of sectoral experts will prepare a general guideline to incorporate disaster risk reduction agenda for the sectors. DM&RD will also be responsible for overall monitoring and follow-up of the process to ensure that disaster risk reduction agenda are mainstreamed within the sectoral policies, plans and programmes. The development plans should address, among others, the following:

a. Defining and redefining risk environment through hazard analysis, vulnerability assessment, risk evaluation, risk treatment options, and risk treatments.
b. Managing the risk environment by developing programs and strategies that eliminate, or reduce the level of risk. Traditionally mitigation programs were viewed as engineering solutions to eliminate risk, but it is now accepted that all activities undertaken to eliminate or reduce risk are "mitigation" strategies (e.g. community education and awareness, planning activities, development of warning systems). This includes activities previously described as the PPRR Model- Prevention, Preparedness, Response and Recovery.
c. Regularly review and update the plan; and
d. Submit a copy of the plan, and of any amendment thereto, to appropriate authority including the DM&RD.
e. Submit a copy of its disaster management plan, and of any amendment thereto, the concerned authority.

11.7 HAZARD SPECIFIC MULTI-SECTORAL DISASTER MANAGEMENT PLANS

In addition to area specific disaster management plans and sector specific disaster risk reduction plans, it is envisaged that there will be a few hazard-specific management plans, such as earthquake management plan. This type of plans will be multi-sectoral and will be divided into two components: risk reduction and emergency response. This type of plans will address specific necessities to deal with a particular hazard.

11.7.1 EARTHQUALKE CONTINGENCY PLAN

It is evident from the past history of higher intensity earthquake in this region and the mild shakes experienced in recent dates as an initial call for earthquake in major cities of Bangladesh. The over all development of these cities has taken place with out any caution for the earthquake. As such, it is feared that a high intensity earthquake in these cities may result in to serious devastation and collapse the cities. Thus, a well-designed and fully coordinated plan for optimum and efficient preparedness, response and early recovery, usually known as Contingency Plan, in a systematic manner so that their capacities and resources are best utilized to fulfill the need complimenting and supplementing other agencies. Realizing the need of coordinated and comprehensive emergency response, United Nations has been promoting its humanitarian response activities in a cluster approach. This approach is proved to be effective and efficient in responding to recent disasters, for instances, the response during the earthquake on 8 October 2005 in Pakistan. Hence, it has been decided that this concept of response operations in functional clusters be applied in Bangladesh also in case of possible earthquake disaster.

In this approach, under National Earthquake Contingency Plan, all response activities are grouped into nine relevant operational functional clusters based on the similarity of works,

normal and disaster time mandates of different relevant organizations and possible complementarily in the resources and capacities. The clusters are as follows:

1. Emergency Operations Cluster 1 – Overall Command and Coordination
2. Emergency Operations Cluster 2 – Search, Rescue and Evacuation
3. Health Cluster
4. Relief Services (Food, Nutrition and other Relief) Cluster
5. Shelter (Including Camp Management) Cluster
6. Water Supply, Sanitation and Hygiene Cluster
7. Restoration of Urban Services Cluster
8. Transport (Road, Rail, Air, Sea) Cluster
9. Security and Welfare Cluster

The emergency operations and over all command and coordination under Cluster 1 has been detailed in Annex 2.

11.7.2 Cyclone Shelter Plan

To face the aforesaid challenges particularly cyclone and tidal surges, different governmental & non-governmental organizations have constructed about 2,852 (CDMP 2009) cyclone shelters in the coastal belts of 16 Districts of the country. Out of 2,852 shelters, investigation reveals that 2,590 shelters are useable while 262 are not. These shelters are insufficient in terms of necessity. So it would not be possible to provide shelter to all the affected people as well as their domestic animals. A survey team captioned as Multipurpose Cyclone Shelter Programme (MCSP) headed by Prof. Dr. Jamilur Reza Chowdhury recommended in its report of 1993 to construct 1,250 new cyclone shelter as priority no. 1 and 1,250 as priority no.2 for providing shelters to the affected people during disasters. The report also mentioned that the total number of 2,500 cyclone shelters including primary school, madrashas and secondary schools were proposed to be constructed.

These shelters will be constructed on the government khas land/institution's land /purchased lands. There is a provision of separate latrine facilities for women. One tube-well for each shelter will be set up for supplying pure drinking water. In normal periods, these shelters will be used as educational institution.

It was decided that Bangladesh's plan of action should be inclusive to multi-hazard, all risk, and all sector approach. Therefore, following technical options are considered as critical element of the plan of action.

- Comprehensive Risk assessment (Hazard Assessment and Vulnerability Assessment), including tsunami inundation modeling and evacuation mapping;
- Warning Guidance, including seismic and sea level monitoring, data Evaluation, processing and interpretation, forecasting methods and warning dissemination (a detailed plan of action is prepared);
- Mitigation and Preparedness, including education and awareness Programmes, structural and non-structural mitigations, government policy and emergency management procedures;
- Development of Rescue, Relief and Rehabilitation Plan of Action based on Comprehensive Risk Assessment, and
- Existing Cyclone Preparedness Programme (CPP) should be strengthened in a way that they can prepare the community for tsunami as well as cyclone.

Management Aspects of Shelter Center in Coastal Zones

DMB proposes the facilitating role of local Disaster Management Committee in forming the Cyclone Center Management Committee for each center. The committee will have the following types of representation:

- A member of local Disaster Management Committee
- Locally Elected Representative (UP Member)
- Head Master of local Primary School
- Imam of Local Masjid
- NGO representative
- Women representative

DMB also propose for multipurpose use of the Cyclone Centers by local NGOs, Civil Society Groups and community people for public functions like marriage ceremonies, meetings, training sessions and other social functions under the supervision of CC Management Committee. The users will pay a minimum fee for using CC as maintenance charge. The Management Committee will be responsible for keeping financial statement of CC.

11.7.3 Disaster Resilient Cluster Housing

Climate change is changing the nature of the acute hazards. Bangladesh is suffering from increased numbers of intensified floods, cyclones and storm surge with higher magnitudes resulting damage of assets, properties, killing life and disrupting livelihoods of the millions living in the impacted areas. The impact areas are also spreading over time and space. In order to provide shelter to the people of the impacted areas to the shelters, Bangladesh needs a large numbers of new shelters that has already been discussed in the previous chapter. However, people living in the impacted areas are facing extreme weather events one after another, which are going to increase further in the coming future due to climate change. Early warning in the community language having reasonable lead-time is yet to develop and streamlined. Even if the warning is issued, people are not willing to shift to shelters because of many reasons. First of all there is a lack of awareness and sensitization, early warning are not clear to them and sometimes misleading, and finally they are hesitant to leave their livelihood-earning assets and properties. In the present situation and in the coming future, more such events may make people fatigued to shift to shelters more frequently. As such, this is the time to create alternative and additional options for the disaster-hit community. One of the alternative approaches is to convert houses into shelters. Government shall develop cluster housing for a group of households that are living in marginalized hazard prone lands, initially in Khas land with necessary utilities and infrastructures that are resilient to the hazards. This set up shall have the provisions for cattle and poultry shelter, seedbeds, and schools on raised land. The architecture shall be such that it will be in a position to accommodate the adversity of the hazard impacts.
Comprehensive disaster management programme (CDMP) of the DM&RD shall design, develop, pilot such disaster resilient shelters and scale up upon seeing results.

11.7.4 Tsunami Response Plan

Following the 2004 Tsunami, and based on several exercises, workshops, seminars and meetings, a detailed draft plan of action is prepared for Bangladesh (Annex 3).

12. DISASTER MANAGEMENT ACTION MATRIX 2010-2015

Strategic Goal	Key targets	Expected Outcomes	Action Agenda for 2010-2015	Lead Agency /dept.	Supporting Agency/dept.
1	2	3	4	5	6
1.0 Professionalizing the disaster management system	1.1 Establish a Disaster Management Regulative Framework	1.1.1 A legal, policy and planning framework that makes disaster risk reduction a mandatory requirement for disaster management at all levels.	1.1.1.1 Review and revise key disaster management policy and planning instruments reflecting broader risk reduction functions 1.1.1.2 Enact Disaster Management Act and formulate rules under the Act 1.1.1.3 Develop, approve and implement Disaster Management Policy and Plans 1.1.1.4 Revise Allocation of Business in relation to DM&RD Mandates 1.1.1.5 Revise Standing Orders on Disaster in line with Comprehensive Disaster Risk Reduction and Emergency Management Approach with special emphasis on gender and diversity group	DM&RD DMB	Ministry of Establishment /Ministry of Law, Justice and Parliamentary Affairs/ Cabinet Division/ Sectoral Ministries

Strategic Goal	Key targets	Expected Outcomes	Action Agenda for 2010-2015	Lead Agency /dept.	Supporting Agency/dept.
1	2	3	4	5	6
	1.2 Establish and progressively implement a learning and development strategy to facilitate the professional development of DM&RD and key personnel from government, NGOs and the private sector.	1.2.1 A professional and competent disaster management workforce that is demonstrating effective leadership nationally and regionally	1.2.1.1 To ensure that risk reduction is a mandated requirement for all disaster management programmes 1.2.1.2 Enhance professional skills and knowledge of DM&RD and selected other key implementing agency staff on disaster risk reduction, preparedness, warning and forecasting system, and post-disaster recovery activities 1.2.1.3 Develop a learning and development framework for disaster management professionals 1.2.1.3 Develop and implement a skills enhancement strategy for effective disaster management 1.2.1.4 Promote and establish Graduate Programmes in Disaster Management at the tertiary level 1.2.1.5 Review and recommend disaster management curricula to universities 1.2.1.6 Promote, design and implement research and evaluation programme on disaster management	DM&RD DMB	Ministry of Education (MoEd) MoEd Relevant ministries

Strategic Goal	Key targets	Expected Outcomes	Action Agenda for 2010-2015	Lead Agency /dept.	Supporting Agency/dept.
1	2	3	4	5	6
	1.3 Design and implement training and awareness programmes targeting national and District level policy officials.	1.3.1 All the policy officials at all levels are aware of the disaster management concepts and frameworks	1.3.1.1 Develop an introductory training course for disaster management 13.1.2 Design and implement the training programme for the policy officials at all levels	DM&RD DMB	Relevant ministries NGOs

Strategic Goal	Key targets	Expected Outcomes	Action Agenda for 2010-2015	Lead Agency /dept.	Supporting Agency/dept.
1	2	3	4	5	6
2.0 Mainstreaming Disaster Risk Reduction and Climate Change adaptation	2.1. Risk reduction and climate change adaptation principles and practices are mainstreamed within all development programmes and policies	2.1.1 DM&RD and MoEF are recognized as a key partner in development planning and policy making process (such as NEC, ECNEC, Economic Affairs Council etc.) 2.1.2 Development project appraisal process includes disaster risk reduction and climate change adaptation issues	2.1.1.1 Identify relevant development policy and planning frameworks, develop and establish mechanisms to ensure risk reduction and climate change adaptation is a national and local priority. 2.1.1.2 Develop Disaster Impact and Risk Assessment (DIRA) tool for all hazards and incorporate into the Project Proforma (PP), Technical Project Proforma (TPP) and Project Concept Paper 2.1.1.3 Develop CC Risk and Impact Assessment (CCRIA) tool and incorporate into the Project Proforma (PP), Technical Project Proforma (TPP) and Project Concept Paper (PCP) formats 2.2.1.4 Develop and implement an advocacy strategy facilitating incorporation of disaster risk reduction within development and agency policy and plans. 2.1.1.5 Design and implement capacity building training to strengthen relevant planning capability at national and local levels. 2.1.1.5 Incorporate disaster risk reduction approaches in all ongoing and future development plans, programs, and policies. 2.1.1.6 Inclusion of disaster risk management within the development project validation process through Disaster Impact and Risk Assessment (DIRA) in addition to EIA 2.1.1.7 Projecting future activities	Ministry of Finance and Planning	DM&RD/ Planning Commission/ Ministry of Environment and Forest/Ministry of Water Resources/ Ministry of Agriculture/ NGO Affairs Bureau/Sectoral Ministries/NGOs, Private Sector bodies Development Partners

Strategic Goal	Key targets	Expected Outcomes	Action Agenda for 2010-2015	Lead Agency /dept.	Supporting Agency/dept.
1	2	3	4	5	6
	2.2 Mainstreaming disaster risk reduction and climate change adaptation issues in all the sectoral policies and plans	2.2.1 Sectoral damage and loss from disaster and climate change declined 2.2.2 Strengthened relevant planning capability at all levels. 2.2.2 DRR and CCA options generated 2.2.3 Ensured access to relevant information, experience and knowledge 2.2.4 Enhanced capacity of the planning professionals across the sectors to incorporate DRR and CCA in the development planning 2.2.5 Strengthen relevant institutions 2.2.6 Disaster and CC sensitive infrastructures	2.2.1.1 Establish Focal points within relevant ministries and departments 2.2.1.2 Identify relevant sectoral policy and planning frameworks and documents 2.2.1.3 Review and revise the policy and planning documents incorporating disaster risk reduction and climate change adaptation issues 2.2.1.4 Capacity building of the professionals and practitioners and Institutional strengthening 2.2.1.5 Research to generate options for livelihood adaptation and disaster risk reduction 2.2.1.6 Knowledge management 2.2.1.6 Develop and implement an advocacy strategy facilitating incorporation of disaster risk reduction and climate change adaptation issues 2.2.1.7 Develop and implement climate resilient infrastructures 2.2.1.7 Prepare a monitoring and evaluation Guideline	Relevant Ministries	DM&RD/DMB, MoEF/DoE and Relevant Ministries

Strategic Goal	Key targets	Expected Outcomes	Action Agenda for 2010-2015	Lead Agency /dept.	Supporting Agency/dept.
1	2	3	4	5	6
	2.3 Disaster risk reduction and climate change considerations incorporated in NGO programmes and plans	2.3.1 NGO communities have a better understanding of their risks and strategies for reducing or managing their CC and Disaster risks 2.3.2 Sustainability of community benefits received through NGO interventions	2.3.1.1 Inclusion of Disaster Risk Reduction Mechanism into FD-6 Form (for NGO programmes) 2.3.1.2 Advocacy and public awareness for social mobilization 2.3.1.3 Prepare a monitoring and evaluation Guideline	NGO Affairs Bureau DMB DRR	DM&RD, MoEF/DoE NGOs

Strategic Goal	Key targets	Expected Outcomes	Action Agenda for 2010-2015	Lead Agency /dept.	Supporting Agency/dept.
1	2	3	4	5	6
3.0 Strengthening Institutional Mechanisms	3.1 Capacity Building of DMCs at all levels	3.1.1 Members of DMCs at all levels are aware of their roles and responsibilities 3.1.2 DMCs at all levels are functional and carrying out their mandated jobs during both normal and emergency periods and post emergency situations	3.1.1.1 Revise roles and responsibilities of DMCs in relation to risk reduction and emergency response process; 3.1.1.2 Identify national, regional, sub-regional and local institutional mechanisms including informal systems and undertake an audit to validate roles and linkages 3.1.1.3 Design and implement a national training strategy aimed at building knowledge and understanding of climate change and disaster management roles and responsibilities of key players at all levels as per SOD 3.1.1.4 Promote development and establishment of Disaster Management Plans at all levels 3.1.1.5 Establish local level contingency planning frameworks with provision of resources for risk reduction	DMB	Ministry of Establishment /Ministry of Law, Justice and Parliamentary Affairs/Cabinet Division/Sectoral Ministries/NGOs/ Development Partners

Strategic Goal	Key targets	Expected Outcomes	Action Agenda for 2010-2015	Lead Agency /dept.	Supporting Agency/dept.
1	2	3	4	5	6
	3.2 Create a national training capacity to sustain and progressively expand the training efforts.	3.2.1 Bangladesh Institute of Disaster Management Training and Research is established and well functioning 3.2.2 Disaster Management is taught in all the training courses of the public training institutes 3.2.3 All training institutes used the updated module for disaster management	3.2.1.1 Establish Bangladesh Institute of Disaster Management Training and Research 3.2.1.2 Develop and implement a national training policy to enhance competencies and skills for effective disaster risk reduction and climate change adaptation and emergency response. 3.2.1.3 Incorporate disaster risk reduction and climate change adaptation issues into the training curriculum of all public sector training institutes, such as BPATC, APD, BARD, RDA and specialized training institutes for BCS Cadres. 3.2.1.4 Incorporate disaster risk reduction and climate change adaptation issues into the training curriculum for: - Local government public representatives and officials at all levels. - Teachers at all levels. - Religious leaders of all faith. - Bangladesh Scouts and Ansars and VDPs 3.2.1.5 Conduct TOT and capacity building training for the teachers and instructor of different national training institutions on the revised curriculum 3.2.1.6 Promote gender, cultural and religious sensitivity training as integral components of education and training for disaster risk reduction and climate change adaptation	DMB DM&RD/DMB MoEF/DoE Relevant ministries MoLG&RD, MoED, MoPME, MoRA, Bangladesh Scouts, MoHA Relevant Ministries	Ministry of Finance and Planning; Ministry of Establishment Ministry of Finance and Planning; Ministry of Establishment DM&RD DM&RD DM&RD DM&RD DM&RD

Strategic Goal	Key targets	Expected Outcomes	Action Agenda for 2010-2015	Lead Agency /dept.	Supporting Agency/dept.
1	2	3	4	5	6
	3.4 Develop a national monitoring and evaluation system to enable the effectiveness of the training strategy to be measured.	3.4.1 A common pre- and post-training assessment tool is in place to monitor the disaster management and climate change training programmes of the public training institutes	3.4.1.1 Develop a common methodology to monitor and evaluate the disaster management and climate change training programmes 3.4.1.2 Establish a monitoring and evaluation mechanism about when and what to monitor by whom 3.4.1.3 Establish a reporting mechanism	DMB	Relevant Ministries

Strategic Goal	Key targets	Expected Outcomes	Action Agenda for 2010-2015	Lead Agency /dept.	Supporting Agency/dept.
1	2	3	4	5	6
4.0 Empowering At Risk Communities	4.1 Develop and establish a standard assessment procedure to identify community and household level risks	4.1.1 Communities have a greater understanding of their risks and vulnerabilities to hazards and anticipated climate change risks and strategies for reducing or managing their all-hazards risks.	4.1.1.1 Identify and document community and household level all-hazards risks with special emphasis on risks of diversified group including women, children, the elderly and the disabled, following the standard assessment procedure	DMB	Relevant ministries/ NGOs/ Development Partners

Strategic Goal	Key targets	Expected Outcomes	Action Agenda for 2010-2015	Lead Agency /dept.	Supporting Agency/dept.
1	2	3	4	5	6
	4.2 Establish a disaster risk reduction and climate change adaptation action planning framework	4.2.1 Disaster risk reduction and climate change adaptation action plans for all hazards, all risks and all sectors are produced and endorsed by the relevant DMCs at all levels 4.1.2 Government and donor funding targeting strategies identified within the local level risk reduction plans.	4.2.1.1 Develop a disaster risk reduction and climate change adaptation action planning template through pilot testing 4.2.1.2 Prepare risk reduction and climate change adaptation action plans for all high risk Unions, Upazilas and Districts and endorsed by the respective DMCs 4.2.1.3 Design and implement an advocacy strategy to ensure execution of the plans by the respective concerned authorities	DMB	MoWR, MoF, MoEF, Other Relevant Ministries

Strategic Goal	Key targets	Expected Outcomes	Action Agenda for 2010-2015	Lead Agency /dept.	Supporting Agency/dept.
1	2	3	4	5	6
	4.3 Strengthen community and household level capacity to withstand the disastrous situations	4.3.1 Community and households are better prepared to cope with disaster events	4.3.1.1 Design and implement skill and knowledge based training programme for DMCs 4.3.1.2 Organize community level drills 4.2.1.3 Design and implement livelihood support programmes for at risk communities, particularly women, the elderly, the disabled and other disadvantaged groups.	DMB	Other Relevant Ministries, NGOs

Strategic Goal	Key targets	Expected Outcomes	Action Agenda for 2010-2015	Lead Agency /dept.	Supporting Agency/dept.
1	2	3	4	5	6
	4.4 Reduce vulnerability of the at risk communities through social safety nets	4.4.1 Protect the needs of the poor, particularly women, children, the elderly the disabled and other disadvantaged population of at risk communities against seasonality and shocks	4.4.1.1 Establish guidelines and procedures to design and implement the target based FFW, FFE, CFW, VGD, TR, RRP and other safety net programmes 4.4.1.2 Establish an effective targeting mechanism 4.4.1.3 Establish an effective monitoring and support mechanism to ensure proper execution of the guideline and avoidance of political influences and leakages. 4.4.1.4 Policy advocacy to ensure continuity of the allocations for safety net programmes in the annual budget	DM&RD/DRR DGFood	Other Relevant Ministries, NGOs

Strategic Goal	Key targets	Expected Outcomes	Action Agenda for 2010-2015	Lead Agency /dept.	Supporting Agency/dept.
1	2	3	4	5	6
5.0 Expanding Risk Reduction Programming across hazards and sectors	Across Hazards: 5.1 Update hazard maps such as flood, cyclone, drought, earthquake and tsunami Develop climate change scenarios and accordingly anticipated hazard risks following climate change	5.1.1 Local and national development plans are developed on the basis of the updated hazard maps and anticipated climate change induced hazards	5.1.1.1 Conduct Hazard Risk Analysis and produce updated hazard maps 5.1.1.2 Conduct climate change modelling, cyclone & Storm surge modelling, flood and drought modelling and produce anticipated hazards maps	DM&RD	Ministry of Defence/ MoWR/Ministry of Science and Technology/ BUET/IWM/CEGIS/ NGOs / Development Partners

Strategic Goal	Key targets	Expected Outcomes	Action Agenda for 2010-2015	Lead Agency /dept.	Supporting Agency/dept.
1	2	3	4	5	6
	5.2 Establish an Integrated Approach to disaster management including Climate Change and climate variability impacts	5.1.2 Scientific analysis including climate change impacts is guiding all hazards risk assessment processes 5.1.3 Timely all hazards risk information readily available in user-friendly format to key stakeholders and development planners. 5.1.4 Research gaps are influencing government, donor and private sector priorities. 5.1.5 Disaster Management stakeholders are updated with climate change and climate variability impact knowledge	5.2.1.1 Capacitate the Climate Change Cell (CCC) within DoE 5.2.1.2 Develop scenario and prediction models to determine climate change and climate variability impacts. 5.2.1.3 Conduct research to determine climate change and climate variability impacts for Bangladesh 5.2.1.4 Strengthen existing knowledge and information accessibility on impact prediction and adaptation to climate change 5.2.1.5 Identify adaptation options through action research 5.2.1.6 Establish a climate change information library, database and Knowledge information network 5.2.1.7 Incorporate climate change and climate variability impact information in the disaster Risk reduction programmes design 5.2.1.8 Design and implement capacity building programme to improve understanding on climate change impacts among the DM stakeholders	MoEF	DM&RD Ministry of Defence/ Technological Universities/ MoWR/NGOs/ Development Partners

Strategic Goal	Key targets	Expected Outcomes	Action Agenda for 2010-2015	Lead Agency /dept.	Supporting Agency/dept.
1	2	3	4	5	6
	5.3 Preparedness for Earthquake and Tsunami risks	5.3.1 A heightened level of preparedness to the earthquake and tsunami risks	5.3.1.1 Conduct earthquake and tsunami Vulnerability assessment and prepare: • Earthquake vulnerability and risk maps for mega cities • Tsunami vulnerability maps for all the coastal districts • Map out critical vulnerable infrastructure and communities within the high risk zones	DMB	Ministry of Local Government and Rural Development; Ministry of Home Affairs; Armed Forces Division; Ministry of Housing and Public Works; Ministry of Science and Technology; Ministry of Power, Energy and Mineral Resources; Ministry of Defence; Ministry of Communication; Ministry of Education; Academic Institutions; DM&RD
			5.3.1.2 Introduce Contingency Planning for Non Seasonal Disaster Risks in city corporations response plans	MoLG&RD	
			5.3.1.3 Develop and implement an extensive education and awareness programme for the earthquake and tsunami risk	DMB	
			5.3.1.4 Use of earthquake risk maps in urban planning and development		
			5.3.1.5 Update and ensure compliance of the Bangladesh National Building Code	MoH&PW MoLand MoLG&RD	
			5.3.1.6 Review and revise building safety codes on evacuation of people with emphasis on persons with disabilities	MoH&PW	
			5.3.1.7 Develop and implement retrofitting programmes for vulnerable critical infrastructure	MoH&PW	
			5.3.1.8 Develop and disseminate an Earthquake Risk Reduction Plan		
			5.3.1.9 Develop and disseminate a Tsunami Risk Reduction Plan	Relevant ministries	

Strategic Goal	Key targets	Expected Outcomes	Action Agenda for 2010-2015	Lead Agency /dept.	Supporting Agency/dept.
1	2	3	4	5	6
	5.4 Strengthen national capability to reduce the risks of • Chemical and technological hazards • Biological hazards • Infrastructure collapse • Fire • Road accidents • Launch capsize • Landslide	5.4.1 Reduce the incidence of disasters in the manufacturing industry 5.4.2 Bangladesh Fire Service and Civil Defence is better equipped with latest fire fighting technology including training 5.4.3 Reduced the incidence of launch capsize 5.4.4 Reduce the casualties in road accidents 5.4.5 Enhance nuclear and radiation safety 5.4.6 Reduce risk to biological hazards, e.g. Bird Flu, SARS, Ebola, Anthrax, etc. 5.4.6 Reduce the landslide hazard risks	5.4.1.1 Develop guidelines and risk reduction plans for chemical and technological hazards 5.4.1.2 Establish and regularly update an information database and network on industrial safety measures 5.4.1.3 Identify hazardous installations and promote employee and community preparedness 5.4.1.4 Develop and implement a strategy to strengthen the BFS&CD 5.4.1.5 Develop guidelines for road and water safely 5.4.1.6 Develop and implement nuclear and radiological risk reduction and emergency response plan 5.4.1.7 Develop bio-containment policy, risk reduction plans and facilities (according to Bio Safety Levels) to deal with biological hazards 5.4.1.8 Develop and Implement a broad-based and cooperative landslide risk reduction programme comprising review and revision of relevant policy and legislation, field-based studies of landslides, mapping, laboratory investigations of soil properties, computer modeling of slope stability and movement, and studies of the impacts of groundwater on the stability of potentially unstable slopes	Ministry of Industries MoHA Ministry of Communication, Ministry of Water Transport, MoS&T MoH&FP MoL&F MoEF	DM&RD Ministry of Local Government and Rural Development; Ministry of Home Affairs; Armed Forces Division; Ministry of Housing and Public Works; Ministry of Defence; Ministry of Communication; Academic Institutions; Ministry of Lar Ministry of Local Government, Rural

Strategic Goal	Key targets	Expected Outcomes	Action Agenda for 2010-2015	Lead Agency /dept.	Supporting Agency/dept.
1	2	3	4	5	6
	5.5 Strengthen national capacity for erosion prediction and monitoring	5.5.1 Erosion prediction information used in the local level response and recovery plans, and policy decisions	5.5.1.1 Identify organizations conducting erosion predictions, and assess the utility of the generated information 5.5.1.2 Identify resource requirements and probable source of funding to further capacity strengthening and information generation on a continuous basis 5.5.1.3 Disseminate the information for utilization in development planning and resettlement of vulnerable communities	MoWR	DM&RD, MoLG&RD

Strategic Goal	Key targets	Expected Outcomes	Action Agenda for 2010-2015	Lead Agency /dept.	Supporting Agency/dept.
1	2	3	4	5	6
	Across Sectors: 5.6 Develop and establish policy and planning frameworks to incorporate all hazard (including anticipated risks of climate change) risk reduction perspectives into sectoral policies and development plans, such as: • Agriculture, livestock and fishery • Industry • Education (primary, secondary and Madrasha) • Rural and urban housing, • Construction of roads, bridges and culverts • Water transportation • Health • Water resources • Power, energy and mineral resources • Environment and forestry • Science and Technology • Telecommunication • Water Supply and Sanitation • Food Security • Land Use	5.6.1 Building disaster resilient community elements including population, infrastructure, utility services, life and livelihood support system, etc.	5.6.1.1 Develop guidelines and templates for inclusion of DRR and CCA in sectoral policies and plans 5.6.1.2 Include Disaster Risk Reduction and climate change adaptation in policies and development plans of various relevant sectors as described in section 2.1 and section 2.2 of the Action Matrix 5.6.1.3 Include disaster risk reduction and climate change adaptation perspectives at primary, secondary and tertiary levels of educations as described in section 3.2 of the Action Matrix 5.6.1.4 Promote action research in relevant sector 5.6.1.5 Risk based design of projects and ancillary structure 5.6.1.6 Design and implement Social Safety Net Programmes as described in section 4.5 (of the Action Matrix) to ensure food security of the most vulnerable 5.6.1.7 Identifying and converting existing public buildings into multi-purpose disaster shelters 5.6.1.8 Promote food security as an important factor in ensuring the resilience of communities to hazards 5.6.1.9 Establish a dependable national food security system. 5.6.1.10 Develop and implement a School Safety Programme	DM&RD/DMB Relevant Ministries MoEd, MoPME Relevant Ministries DMB DM&RD/DMB DM&RD/DMB DM&RD/DMB	Ministry of Agriculture, Ministry of Industry, Ministry of Housing and Public Works; Ministry of Science and Technology; Ministry of Power, Energy and Mineral Resources; Ministry of Defence; Armed Forces Division; Ministry of Communication; Ministry of Education; Academic Institutions;

Strategic Goal	Key targets	Expected Outcomes	Action Agenda for 2010-2015	Lead Agency /dept.	Supporting Agency/dept.
1	2	3	4	5	6
6.0 Strengthening Emergency Response Systems	6.1 Strengthen and improve an all Hazard Early Warning Systems through • Technical, technological and physical capacity strengthening of BMD and FFWC • Establishment/strengthening regional networks for real time data/information sharing	6.1.1 Ensure accuracy in the early warning information generation	6.1.1.1 Technical and technological capacity building of BMD, FFWC and other related organizations to a) improve the accuracy of early warning information generated and b) increase the lead time for flood forecast 6.1.1.2 Use SAARC, RCC and other available frameworks and platforms to establish regional networks for real time data/information sharing	DM&RD/ Ministry of Defence/MoWR	Armed Forces Division; Ministry of Post and Telecommunication ; MoHA; SMRC; NGOs Development Partners

Strategic Goal	Key targets	Expected Outcomes	Action Agenda for 2010-2015	Lead Agency /dept.	Supporting Agency/dept.
1	2	3	4	5	6
	6.2 Establish and operate a National Disaster Management Information Centre with an internet connection with all the 64 Districts and high-risk Upazila DMCs • To archive and share disaster risk reduction information • To produce and share policy briefs • To receive and disseminate early warning information • To receive and disseminate information on emergency need assessments and management	6.2.2 An effective 24/7 information hub including early warning dissemination system 6.2.3 An effective information management system that is providing on-time adequate and necessary information during emergency situations	6.2.1.1 Establish and make operational the National Disaster Management Information Centre including emergency operation centres (EOC) 6.2.1.2 Design the information products 6.2.1.3 Produce and disseminate regular information products in time intervals	DM&RD	Ministry of Defence; Armed Forces Division; MoWR; NGOs; Development Partners

Strategic Goal	Key targets	Expected Outcomes	Action Agenda for 2010-2015	Lead Agency /dept.	Supporting Agency/dept.
1	2	3	4	5	6
	6.3 Establish an effective Community Alerting System through capacity strengthening of CPP and DMCs at District, Upazila and Union levels	6.3.1 An effective communication network to timely disseminate all hazard warning messages to the communities 6.3.2 A disaster management information network is operational and demonstrated down to household level	6.3.1.1 Develop and establish an all hazards community alerting system and impart training to enhance its operational capability. 6.3.1.2 Organize regular drills to improve the efficiency of the system	DM&RD/DMB	MoWR/MoD/NGOs /BDRCS

Strategic Goal	Key targets	Expected Outcomes	Action Agenda for 2010-2015	Lead Agency /dept.	Supporting Agency/dept.
1	2	3	4	5	6
	6.4 Establish and improve Search and Rescue Mechanism by • Preparing a potential search and rescue scenario • Strengthening S&R capability of first responding institutions by providing training and equipments support • Establish an all hazard volunteer groups for S&R operations • Establish an effective command and control system	6.4.1 An effective search and rescue mechanism to provide timely operations 6.4.2 First Responding Institutions are fully equipped to efficiently handle the S&R operations 6.4.3 A well-trained standby volunteer workforce to assist in S&R operations	6.4.1.1 Identify potential rescue scenarios and determine appropriate search and rescue equipment needs 6.4.1.2 Strengthen BFS&CD and other first responding institutions with required training and equipment support 6.4.1.3 Establish and strengthen the community based institutional mechanism for disaster volunteering, such as CPP, BNDV, Bangladesh Scouts and Ansar and VDP 6.4.1.4 Develop and implement a training programme to establish the all hazard volunteer workforce at city corporations level 6.4.1.5 Prepare SOPs for specific hazard based disasters incorporating command, control and coordination mechanism for emergency response 6.4.1.6 Design and integrate disability guidelines within search and rescue training system	MoHA/Armed Forces Division/ Local Government Bodies/ MoHA DMB BDRCS BS MoHA LGD DM&RD	DM&RD/ MoH&PW/MoLG&RD/MoD/MoPE&MR/ NGOs

Strategic Goal	Key targets	Expected Outcomes	Action Agenda for 2010-2015	Lead Agency /dept.	Supporting Agency/dept.
1	2	3	4	5	6
	6.5 Develop and establish emergency response plans	6.5.1 An all hazard response plan is established at all levels 6.5.2 Emergency response operations during disaster are well coordinated	6.5.1.1 Review the existing emergency response plans at all levels 6.5.1.2 Develop and establish emergency response plan for all hazards at all levels as per the guideline described in section XI (pp. 55-62) 6.5.1.3 Develop and implement a standard relief management procedure 6.5.1.4 Strengthen the District and Upazila DMCs to prepare their respective response plans 6.5.1.5 Administration, coordination and monitoring of emergency relief and rehabilitation programmes, such as design, approval and distribution of relief materials, gratuitous relief etc. 6.5.1.6 Promote planning and practicing of emergency evacuation routes for persons with disability	DM&RD/DMB/ DRR	Relevant ministries, Armed Forces Division; NGOs, development partners, CBOs and the Private sector

Strategic Goal	Key targets	Expected Outcomes	Action Agenda for 2010-2015	Lead Agency /dept.	Supporting Agency/dept.
1	2	3	4	5	6
	6.6 Develop and establish post disaster recovery and reconstruction mechanism		6.6.1.1 Review existing damage and needs assessment systems and strengthen where necessary 6.6.1.2 Establish a standard sector specific damage and loss assessment methodology 6.1.1.18 Incorporate disaster risk reduction measures into post-disaster recovery and rehabilitation processes and use opportunities during the recovery phase to develop capacities that reduce disaster risk in the long-term , including through the sharing of expertise, knowledge and lessons learned 6.1.1.19 Enhance recovery schemes including psycho-social training programmes in order to mitigate the psychological damage of vulnerable populations, particularly children, the elderly and the disabled, in the aftermath of disasters	DM&RD DM&RD Relevant Ministries Relevant Ministries	Relevant Sectoral Ministries and departments; Armed Forces Division

Strategic Goal	Key targets	Expected Outcomes	Action Agenda for 2010-2015	Lead Agency /dept.	Supporting Agency/dept.
1	2	3	4	5	6
7.0 Developing and Strengthening regional and global Networks	7.1 Establish public and private partnerships for disaster risk reduction.	7.1.1 To create a working interface with and between the technical and scientific community	7.1.1.1 Identify national disaster management players 7.1.1.2 Establish formal and informal partnerships through signing of Memorandum of Understandings and Letter of Agreements	DM&RD/DMB	Relevant Ministries, Departments, NGOs, Academic Institutions

Strategic Goal	Key targets	Expected Outcomes	Action Agenda for 2010-2015	Lead Agency /dept.	Supporting Agency/dept.
1	2	3	4	5	6
	7.2 Support regional and global initiatives and ensure representation that is consistent with the government integrated all sector risk reduction approach at all levels	7.2.1 To establish formal and informal partnerships with regional organizations for enhanced information exchange and mutual support 7.2.2 Facilitate information sharing and more effective cross border mutual support programmes including early warning mechanisms. 7.2.3 Timely cross border early warning. 7.2.4 Appropriate representation at regional and international forums. 7.2.5 Formalized public private partnerships	7.2.1.1 Identify key regional collaborating organizations and develop systems for coordination, and knowledge sharing. 7.2.1.2 Negotiate on cross border information to enhance early warning. 7.2.1.3 Use SAARC, ASEAN and RCC platforms to establish regional networks for real time data/information sharing as well as sharing of new knowledge and technology. 7.2.1.3 Prepare a guideline for international assistance for disaster emergencies 7.2.1.4 Actively involve in activities of ADRC, Japan and ADPC, Thailand 7.2.1.5 Liaise and cooperate with Global Disaster Alert and Coordination System (GDACS) and International Search and Rescue Advisory Group (INSARAG) 7.2.1.6 Support and collaborate with UNISDR 7.2.1.7 Liaise and cooperate with SAARC Disaster Management Centre (SDMC)	MoFA DM&RD DM&RD DM&RD DM&RD/DMB DM&RD DM&RD DM&RD	DM&RD/MoD/MoWR/MoP&T/NGOs/ Regional and International Organizations

13. IMPLEMENTATION AND FOLLOW-UP

1. Disaster management which includes disaster risk reduction and emergency response management will be viewed holistically and the strategic goals and priorities for action presented in Section XII should be addressed by various stakeholders in a multi-sectoral approach, including the development sector.

2. All relevant organizations and agencies will integrate disaster risk reduction considerations into their sustainable development policy, planning and programming at all levels. DM&RD as the focal agency for disaster management will provide the guidelines to be developed with the participation of sectoral experts to ensure its compatibility.

3. Civil society, including volunteers and community-based organizations, the scientific community and the private sector are vital stakeholders in disaster management. DM&RD will ensure contribution of all actors in the development and implementation of the plan to build disaster resilient nations and communities.

4. Following the broader guideline described in the National plan and the specific guidelines to be provided by DM&RD, the District, Upazila, Union, City Corporation and Pourashava disaster management committees will prepare their respective plans for the area of responsibility of the committee.

5. DM&RD with the assistance from sectoral experts will develop a general guideline to mainstream disaster risk reduction within their respective sectoral development plans.

6. The planning process at all levels should be completed by December 2010.

14. MONITORING AND EVALUATION

The National Plan is a dynamic document and will be reviewed and evaluated annually to ensure consistency with national initiatives and Government priorities. Key performance indicators will be monitored and reported annually to assess the progress of the implementation of the Framework. The key indicators will:

- Measure the expected outcomes of the Plan.
- Set benchmarks.
- Measure the effectiveness of policies, strategies and programs and inform policy development.
- Identify agency accountability and responsibility for each performance indicator.
- Identify opportunities for improvement that lead to enhancement of the Disaster Management System

The IMDMCC will be responsible for monitoring progress of implementation of this plan at the national level. The DM&RD through Disaster Management Bureau will be responsible for monitoring at the local level.

15. FINANCING OF THE PLAN

15.1. National Disaster Response and Recovery Fund

The Government will constitute a fund called the "National Disaster Response and Recovery Fund" from its own resources and donations from home and abroad. The fund shall be used for response, relief and recovery. The allocation and utilization of the fund shall be governed as per rules and guidelines laid down by the Government. Disaster Management and Relief Division, in consultation with Ministry of Finance, will take initiative to establish the fund by consolidating the existing relief funds.

15.2. National Risk Reduction Fund

The Government will constitute a fund called the "National Risk Reduction Fund" for projects which are designed for the purpose of prevention, mitigation and preparedness. The allocation and utilization of the fund shall be governed as per rules and guidelines laid down by the Government. Disaster Management and Relief Division, in consultation with Ministry of Finance, will take initiative to establish the fund by consolidating the existing risk reduction funds.

15.3. Financing Sectoral Plans

Relevant Ministries/ Divisions/ Directorates and departments will make provisions in its annual budget to fund the activities and programmes set out in the Disaster Risk Reduction component of its Sectoral Development Plans.

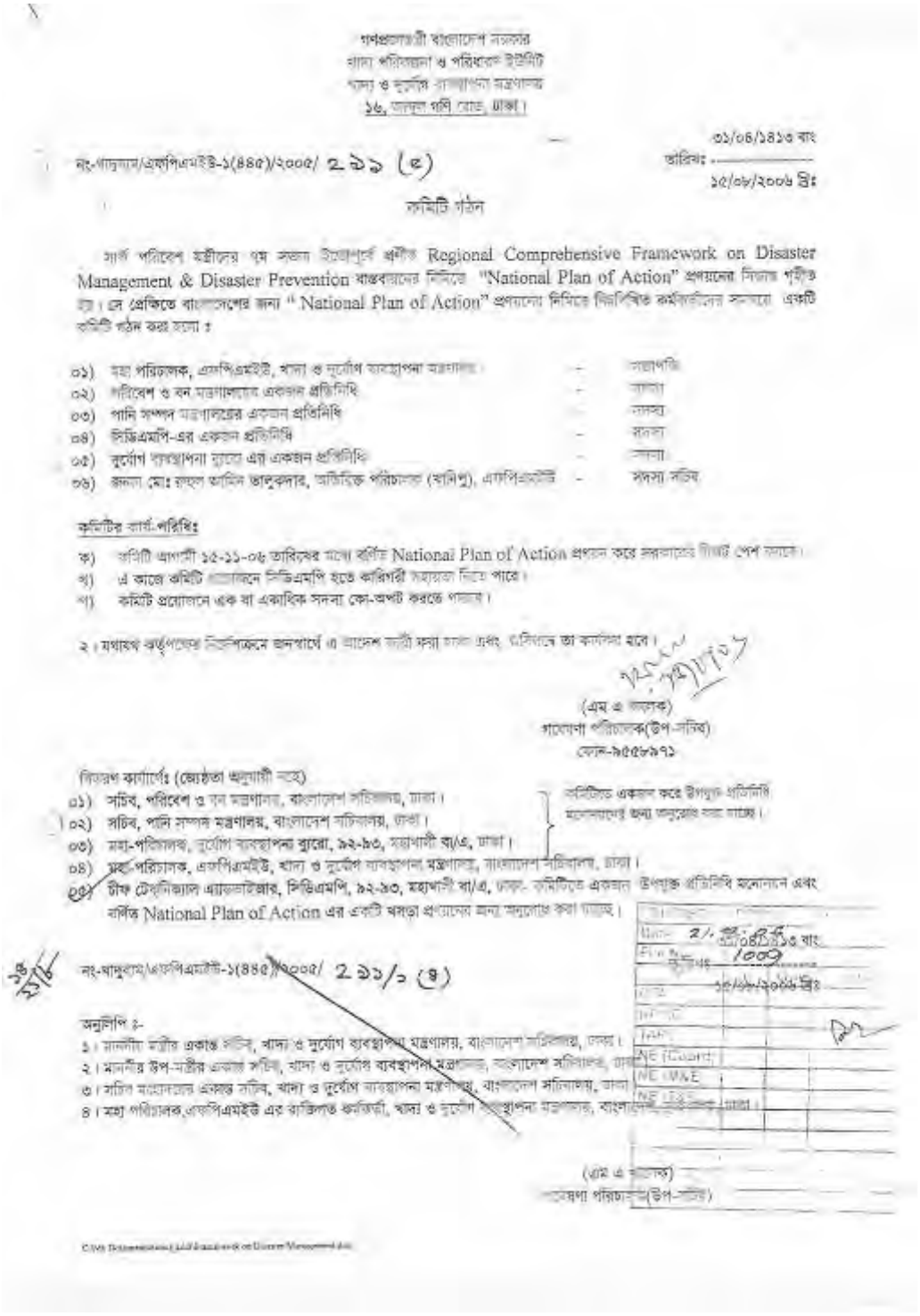
15.4. District/Upazila/Union/Paurashava/City Corporation Disaster Management Fund

Disaster Management Committees at the district, upazila, union, city corporation and paurashava levels will constitute its Disaster Management Fund to implement programmes and activities as set out in Disaster Management Plans. This fund will make up of the following: a) contribution from the government, b) contribution from local government and c) local donation. The government will formulate guideline for operating the fund.

15.5 Reporting

The authority/authorities responsible for the utilization of funds shall submit specific report(s) to the Governments regarding executions of, and expenditures of funds along with an audit certification. The period of time not for such reports shall be as prescribed by the rules and guidelines for the use of funds.

ANNEX 1
DM&RD COMMITTEE FOR RECOMMENDING THE NATIONAL PLAN



গণপ্রজাতন্ত্রী বাংলাদেশ সরকার
খাদ্য পরিকল্পনা ও পরিবেশ ইউনিট
খাদ্য ও দুর্যোগ ব্যবস্থাপনা মন্ত্রণালয়
১৬, তালপুকুর গলি রোড, ঢাকা।

নং-খাদ্যমন্ত্রণালয়/এফপিএমইউ-১(৪৪৫)/২০০৫/ ২৯১ (৫)

তারিখঃ ৩১/০৪/১৪১৩ বাং
১৫/০৮/২০০৬ ইং

কমিটি গঠন

সার্ক পরিবেশ মন্ত্রীদের ৭ম সভায় ইতোপূর্বে গৃহীত Regional Comprehensive Framework on Disaster Management & Disaster Prevention বাস্তবায়নের নিমিত্তে "National Plan of Action" প্রণয়নের নিমিত্ত গৃহীত হয়। এ প্রেক্ষিতে বাংলাদেশের জন্য " National Plan of Action" প্রণয়নে নিম্নে বিবৃত্তিত কর্মকর্তাদের সমন্বয়ে একটি কমিটি গঠন করা হলো ঃ

০১)	মহা পরিচালক, এফপিএমইউ, খাদ্য ও দুর্যোগ ব্যবস্থাপনা মন্ত্রণালয়	-	সভাপতি
০২)	পরিবেশ ও বন মন্ত্রণালয়ের একজন প্রতিনিধি	-	সদস্য
০৩)	পানি সম্পদ মন্ত্রণালয়ের একজন প্রতিনিধি	-	সদস্য
০৪)	সিডিএমপি-এর একজন প্রতিনিধি	-	সদস্য
০৫)	দুর্যোগ ব্যবস্থাপনা ব্যুরো এর একজন প্রতিনিধি	-	সদস্য
০৬)	জনাব মোঃ রফিল আমিন তালুকদার, অতিরিক্ত পরিচালক (বানিপু), এফপিএমইউ	-	সদস্য সচিব

কমিটির কার্য-পরিধিঃ

ক) কমিটি আগামী ১৫-১১-০৬ তারিখের মধ্যে বর্ণিত National Plan of Action প্রণয়ন করে মন্ত্রণালয়ে চূড়ান্ত পেশ করবে।
খ) এ কাজে কমিটি প্রয়োজনে সিডিএমপি হতে কারিগরী সহায়তা নিতে পারে।
গ) কমিটি প্রয়োজনে এক বা একাধিক সদস্য কো-অপ্ট করতে পারবে।

২। যথাযথ কর্তৃপক্ষের নির্দেশক্রমে জনস্বার্থে এ আদেশ জারী করা হলো এবং অবিলম্বে তা কার্যকর হবে।

(এম এ [illegible])
পরিচালক(উপ-সচিব)
ফোন-৯৫৫৮৯৭১

বিতরণ কার্যার্থেঃ (জ্যেষ্ঠতা অনুযায়ী নহে)

০১) সচিব, পরিবেশ ও বন মন্ত্রণালয়, বাংলাদেশ সচিবালয়, ঢাকা।
০২) সচিব, পানি সম্পদ মন্ত্রণালয়, বাংলাদেশ সচিবালয়, ঢাকা।
০৩) মহা-পরিচালক, দুর্যোগ ব্যবস্থাপনা ব্যুরো, ৯২-৯৩, মহাখালী বা/এ, ঢাকা।
০৪) মহা-পরিচালক, এফপিএমইউ, খাদ্য ও দুর্যোগ ব্যবস্থাপনা মন্ত্রণালয়, বাংলাদেশ সচিবালয়, ঢাকা।
০৫) চীফ টেকনিক্যাল এ্যাডভাইজার, সিডিএমপি, ৯২-৯৩, মহাখালী বা/এ, ঢাকা- কমিটিতে একজন উপযুক্ত প্রতিনিধি মনোনয়ন এবং বর্ণিত National Plan of Action এর একটি খসড়া প্রণয়নের জন্য অনুরোধ করা যাচ্ছে।

কমিটিতে একজন করে উপযুক্ত প্রতিনিধি মনোনয়নের জন্য অনুরোধ করা যাচ্ছে।

নং-খাদ্যমন্ত্রণালয়/এফপিএমইউ-১(৪৪৫)/২০০৫/ ২৯১/১ (৫)

অনুলিপি ঃ-

১। মাননীয় মন্ত্রীর একান্ত সচিব, খাদ্য ও দুর্যোগ ব্যবস্থাপনা মন্ত্রণালয়, বাংলাদেশ সচিবালয়, ঢাকা।
২। মাননীয় উপ-মন্ত্রীর একান্ত সচিব, খাদ্য ও দুর্যোগ ব্যবস্থাপনা মন্ত্রণালয়, বাংলাদেশ সচিবালয়, ঢাকা।
৩। সচিব মহোদয়ের একান্ত সচিব, খাদ্য ও দুর্যোগ ব্যবস্থাপনা মন্ত্রণালয়, বাংলাদেশ সচিবালয়, ঢাকা।
৪। মহা পরিচালক,এফপিএমইউ এর ব্যক্তিগত কর্মকর্তা, খাদ্য ও দুর্যোগ ব্যবস্থাপনা মন্ত্রণালয়, বাংলাদেশ সচিবালয়, ঢাকা।

(এম এ [illegible])
পরিচালক(উপ-সচিব)

ANNEX 2

CLUSTER 1: EMERGENCY OPERATIONS – OVERALL COMMAND AND COORDINATION FOR EARTHQUAKE

CLUSTER 1- EMERGENCY OPERATIONS- OVERALL COMMAND AND COORDINATION				
Objective: To prepare a framework for integrated response efforts by formulating a well coordinated system for reduction of impacts of potential earthquake events				
Cluster Lead: DMB, National EOC				
Responsible Ministry: Ministry of Food and Disaster Management				
Main tasks assigned to lead and support agencies: 1) Network with National Emergency Operations Centre (NEOC), contributions to NEOC functions and periodic reporting on readiness 2) Contributions to disaster event response reporting system Institutional 3) ICS development at various levels 4) Participate in the Command, Control, Coordination Structure 5) Network with other agencies for information dissemination				
Expected Main Tasks by UN cluster partners: • Technical assistance in Setting up the National EOC • Contributions for building the capacity of NEOC				
Expected Main Tasks by other associated agencies: • Participate in Disaster event response reporting • Public information dissemination related to emergency declaration, announcements & warnings on after shocks • Disseminate public awareness & advocacy material to support contingency plan implementation				
	ACTIVITIES	**LEAD AGENCY**	**SUPPORT AGENCIES/INSTITUTIONS**	**GLOBAL CLUSTER PARTNER (PROPOSED) /OTHER ASSOCIATE AGENCIES**
Pre-disaster Phase	Development of Standard Operation Procedure (SOP)	DMB	AFD, DRR, Ansar & VDP, RAB, Coast Guard, DMC, DFP, BDR, Police	Global cluster partners - UNOCHA, UNRC, World Bank, UNDP
	Establish National level 24/7 National Emergency Operation Centre (National EOC) and participate in EOC operations and reporting of readiness	DMB	FSCD, AFD, DRR, Police,	
	Setting up earthquake Incident Command Systems (ICS) in place (establishment, training and capacity building) where appropriate	DMB,	FSCD, AFD, DRR, Ansar & VDP, Cost Guard, DMC, DFP, BDR,	
	Develop a disaster event response reporting system by stakeholder agencies (impacts, resource needs, actions by them for reducing the impact, difficulties, opportunities etc) during earthquake/any other disaster event	DMB	DRR	
	Promotion of informal education on earthquake Contingency Plan operations at all levels and conduct simulations	FSCD, NCB	Dept. of Mass Communication, NGOs	

	Develop guidelines for media agencies on reporting disaster events procedures for public information dissemination related to emergency declaration, announcements & warnings on after shocks and disseminate public awareness & advocacy material to support contingency planning and implementation	DMB	Office of Deputy Commissioners, PID, Bangladesh Television, Bangladesh Betar, Private TV channels, Radio channels, News papers	
Emergency Response Phase	Facilitate mobilization of earthquake incident command system where necessary under the command of AFD and Networking with organizations under ICS	DMB, National EOC	FSCD, AFD, DGHS, DRR, BTRC, BP, RHD, BIWTA, BCAA, BR, Civil Aviation Authorities, Office of Divisional Commissioners, Local Government bodies, Utility agencies and PID	Global cluster partners - UNOCHA, UNRC
	Execute operation surveillance continuously covering all the earthquake affected areas	DMB	FSCD, AFD, DGHS, DRR, BTRC, BP, RHD, BIWTA, BCAA, BR, Civil Aviation Authorities, Office of Divisional Commissioners, Local Government bodies, Utility agencies and PID	
	Expansion of National EOC to address the needs after earthquake disaster event and facilitate EOC operations, Daily or periodic reporting by stakeholders	DMB, National EOC	FSCD, AFD, DGHS, DRR, BTRC, BP, RHD, BIWTA, BCAA, BR, Civil Aviation Authorities, Office of Divisional Commissioners, Local Government bodies, Utility agencies and PID	
	Mobilize ICS teams at lower level command structure	DMB	FSCD, AFD, DGHS, DRR, BTRC, BP, RHD, BIWTA, BCAA, BR, Civil Aviation Authorities, Office of Divisional Commissioners, Local Government bodies, Utility agencies and PID	
	Facilitate coordination of logistic supply management	DMB/AFD/DRR	FSCD, AFD, DGHS, DRR, BTRC, BP, RHD, BIWTA, BCAA, BR, Civil Aviation Authorities, Office of Divisional Commissioners, Local Government bodies, Utility agencies and PID	Others – BDRCS, NGOs, INGO

	Assist authorities for communications with media in relation to information dissemination on welfare of victims, Missing and found, Results on Damage assessment surveys, Results on need assessment surveys and facilitate media coverage by media agencies on reporting earthquake disaster event	PID	DMB, Office of Deputy Commissioners, Bangladesh Television, Bangladesh Betar	
	Facilitate public information dissemination related to emergency declaration, announcements & warnings on after shocks and repeat of occurrences of other collateral hazards due to aftershocks	PID	DMB, Office of Deputy Commissioners, Bangladesh Television, Bangladesh Betar, Department of Mass Communication	
Early Recovery Phase	Coordinate Operation Surveillance to reduce impacts due to aftershocks	DMB/ AFD	All first responder organizations (AFD, FSCD, DGHS, DRR), Local Government Bodies, Utility Agencies	Global cluster partners - UNOCHA, UNRC
	Facilitate coordination of logistic supply management and deployment of resources to affected areas, IDP camps etc	DMB/ AFD	All first responder organizations (AFD, FSCD, DGHS, DRR), Local Government Bodies, Utility Agencies	
	Conduct Post disaster Evaluation of performance of • Earthquake incident command system and recommend improvements • Performance of National EOC and improvement where necessary	DMB	All first responder organizations (FSCD, DGHS, DRR), Local Government Bodies, Utility Agencies	
	Facilitate continuation of EOC operations and periodic reporting during early recovery period to EOC on involvement of all first responder organizations in earthquake event management and for necessary assistance	DMB	All first responder organizations (FSCD, DGHS, DRR), Local Government Bodies, Utility Agencies	
	Facilitate media coverage by media agencies on reporting of post-earthquake disaster event situation analysis and facilitate public information dissemination related to emergency declaration, Announcements & warnings on after shocks and possible impacts due to collateral hazards	PID, DMB (National EOC)	Electronic and Print media	Others – BDRCS, NGOs, INGO

	Assist authorities for communications with media in relation to information dissemination on welfare of victims, Missing and found, Results on damage assessment surveys, Results on need assessment surveys	PID, DMB (National Earthquake EOC)	DRR, Electronic and Print media	
	Review the Contingency Plans under the Cluster - Emergency Operations- Overall Command and Coordination and revise the same to include suitable modifications to improve the performance	DMB (National EOC)	All first responder organizations (FSCD, DGHS, DRR), Local Government Bodies, Utility Agencies	

ANNEX 3
PLAN OF ACTION FOR TSUNAMI RISK REDUCTION

Proposed Action Narratives	1-3 Months	4-24 Months	25-60 Months	61-120 Months	Proposed Responsibility
Conduct a Comprehensive Study on Tsunami Risk Assessment (from geological, geographical, social, economic, political and cultural perspectives) with the collaboration of National and International Experts					▪ Disaster Management Bureau ▪ Geological Survey of Bangladesh ▪ Institute for Oceanographic Research
Upgrade the present Non IP link to Tokyo through New Delhi to direct IP link to Tokyo (Japan Meteorological Department).					▪ Disaster Management and Relief Division ▪ Bangladesh Metrological Department
Establish Direct Communication link through V-SAT with Pacific Ocean Tsunami Warning Centre at Hawaii.					▪ Disaster Management and Relief Division ▪ Bangladesh Metrological Department
Establish Direct Communication Link the proposal in Indian Ocean Tsunami Warning Centre					▪ Bangladesh Metrological Department ▪ DMB-Disaster Management Information Centre (DMIC)
Install and Modernize Seismic Equipments in 4 Earthquake Observation Centres in Bangladesh					▪ Bangladesh Metrological Department

Proposed Action Narratives	1-3 Months	4-24 Months	25-60 Months	61-120 Months	Proposed Responsibility
Designate one Emergency Focal Person in Prime Minister's Office, Disaster Management and Relief Division, Disaster Management Bureau, Directorate of Relief and Rehabilitation, Bangladesh Metrological Department, Fire Service and Civil Defense, Bangladesh Police, Ministry of Information, Department of Mass Communication, Bangladesh Red Crescent and CPP and develop an internal emergency communication system at National Level.					▪ All concerned Ministry ▪ All Concerned Directorate/Department ▪ Disaster Management Bureau
Organize Workshop on "Community Based and National Multi Hazard Warning System Development" with the Participation of Bangladesh Betar, Bangladesh Television, Private Television Channels, CPP, Bangladesh Police, Bangladesh Navy, Bangladesh Army, Fire Service and Civil Defense, Bangladesh Metrological Department, Bangladesh Geological Survey, Ministry of Information, Disaster Management and Relief Division, Disaster Management Bureau, Prime Minister's Office, Flood Forecast and Warning Centre and Bangladesh Red Crescent Society.					▪ **Disaster Management Bureau**
Designate one Emergency Focal Person in Each Disaster Management Committee (from National to Local)					▪ Disaster Management Bureau ▪ Directorate of Relief and Rehabilitation
Assign roles and responsibilities of the emergency focal persons and arrange necessary training					▪ **Disaster Management Bureau** ▪ **CDMP**

Proposed Action Narratives	1-3 Months	4-24 Months	25-60 Months	61-120 Months	Proposed Responsibility
Develop an Efficient and Effective Communication System which will enable to disseminate emergency messages to all focal persons at a time without any time loss					▪ Disaster Management Bureau ▪ Bangladesh Metrological Department ▪ **CDMP**
Develop Local Warning (Siren) System, which will enable to disseminate warning messages very quickly to the people at risk.					▪ Ministry of Local Government ▪ Disaster Management Bureau ▪ Directorate of Fire Service and Civil Defense
Setup Disaster Management Information Centres at District Level					▪ Disaster Management Bureau ▪ Directorate of Relief and Rehabilitation ▪ DMIC
Setup Disaster Management Information Centres at Upazila Level					▪ Disaster Management and Relief Division
Develop a multi channel warning message communication system					▪ Ministry of Information ▪ Ministry of Home Affairs ▪ Ministry of Defense ▪ Disaster Management Bureau ▪ Cyclone Preparedness Programme ▪ DMIC ▪ NGOs
Establish mechanism to use the radio network of the Bangladesh Police for Disseminating Emergency Warning Messages to Local Level					▪ Disaster Management Bureau ▪ Bangladesh Police ▪ Bangladesh Metrological Department ▪ DMIC
Train the Bangladesh Police on Disaster Warning Message Dissemination					▪ Disaster Management Bureau ▪ Bangladesh Police ▪ DMIC
Provide orientation training to Fire Service and Civil Defense, Red Crescent, CPP, DRR Officers and Volunteers on Tsunami					▪ Disaster Management Bureau ▪ CDMP ▪ Bangladesh Red Crescent Society ▪ Cyclone Preparedness Programme ▪ DRR
Hold a Dialogue with Water Resource Ministry for integrating Tsunami issues into Coastal Zone Management Policy and Plan					▪ Ministry of Water Resources ▪ Disaster Management Bureau ▪ Geological Survey of Bangladesh

Proposed Action Narratives	1-3 Months	4-24 Months	25-60 Months	61-120 Months	Proposed Responsibility
Incorporate Tsunami Risks in land use planning in Coastal Zone Development Plans developed by Ministry of Water Resources					▪ Ministry of Water Resources ▪ Disaster Management Bureau ▪ DRR
Prepare an Institutional Resource Map of Coastal Zone					▪ Disaster Management Bureau ▪ CDMP
Prepare Institutional Resources for using in warning, evacuation and rescue work					▪ Disaster Management Bureau ▪ Cyclone Preparedness Programme ▪ NGOs & DRR
Undertake mass awareness programme in Mass Media					▪ Disaster Management Bureau ▪ Directorate of Mass Communication ▪ CDMP
Train Local Government Representatives, Imams and Teachers of Coastal Zone					▪ Local Government Division/NILG
Arrange a workshop with Ministry of shipping on Inclusion of Tsunami Issues into the Action Plan of Ministry					▪ Ministry of Shipping ▪ Disaster Management Bureau ▪ Bangladesh Metrological Department
Conduct a mock exercise on Tsunami Warning and Evacuation Preparedness					▪ Disaster Management Bureau ▪ Directorate of Fire Service and Civil Defense ▪ Cyclone Preparedness Programme ▪ NGOs, DRR
Prepare Evacuation Route in the Tsunami and Cyclone Risk areas with the existing CPP facilities and strength					▪ Disaster Management Bureau ▪ Cyclone Preparedness Programme ▪ NGOs, DRR
Prepare a awareness video on Tsunami and Cyclone and Disseminate the Video to the Hotels in Cox's Bazar and Kuakata for regular broadcasting in satellite channel					▪ Ministry of Civil Aviation and Tourism ▪ Disaster Management Bureau ▪ CDMP, DRR

Proposed Action Narratives	1-3 Months	4-24 Months	25-60 Months	61-120 Months	Proposed Responsibility
Motivate Education Ministry and LGED to design and construct schools in coastal zone considering Tsunami and Cyclone risks					▪ Ministry of Education ▪ Ministry of Primary and Mass Education ▪ Disaster Management Bureau ▪ LGED ▪ Department of Education Engineering
Establish s GO-NGO network for Tsunami Risk Reduction in Coastal Zone					▪ Disaster Management Bureau ▪ NGO Affairs Bureau
Train teachers and aware students on tsunami issues.					▪ Ministry of Education ▪ Ministry of Primary and Mass Education ▪ Disaster Management Bureau
Incorporate tsunami issues in disaster related acts, curriculums, action plans, standing orders and other documents of government.					▪ Disaster Management and Relief Division ▪ Disaster Management Bureau ▪ Directorate of Relief and Rehabilitation
Mass awareness among people at risk, civil society, journalists, volunteers, NGOs, youth clubs, mosques, madrashas, temples, churches, pagodas and professionals					▪ Disaster Management Bureau
Develop a guideline for proper maintenance of cyclone and tsunami shelters					▪ Disaster Management Bureau
Develop separate building code for coastal zone considering the tsunami, cyclone, salinity, storm surge and other hazards in coastal zone					▪ Ministry of Housing and Public Works ▪ Disaster Management Bureau
Integrate Bangladesh Metrological Department within the Disaster Management and Relief Division					▪ Prime Minister's Office ▪ Cabinet Division
Construct more multi-purpose Disaster shelters in coastal zone					▪ Ministry of Housing and Public Works ▪ Ministry of Education ▪ Ministry of Primary and Mass Education ▪ Disaster Management Bureau, DRR

Proposed Action Narratives	1-3 Months	4-24 Months	25-60 Months	61-120 Months	Proposed Responsibility
Take initiative for introducing community radio system in coastal zone					▪ Ministry of Information ▪ Disaster Management Bureau
Include Fire Stations of coastal zone under radio network					▪ Ministry of Information ▪ Disaster Management Bureau ▪ Directorate of Fire Service and Civil Defense ▪ Bangladesh Police
Review land use planning of tsunami risk areas for building of infrastructure, housings, industries, and cities.					▪ Ministry of Land ▪ Ministry of Industry ▪ Ministry of Local Government ▪ Disaster Management Bureau
Revisit the strength of construction of existing hotels in Cox's Bazar and Kuakata beach from tsunami perspective, and strengthen the construction to ensure it's tsunami resilience					▪ Ministry of Civil Aviation and Tourism ▪ Disaster Management Bureau ▪ Ministry of Housing and Public Works
Strengthen coastal forestry programme (with special emphasis on bamboo and bush category plants)					▪ Disaster Management Bureau ▪ Directorate of Forest, BWDB
Increase the plantation of bamboo and cane and train the people on bamboo and cane based small and cottage industries.					▪ Directorate of Forest ▪ Bangladesh Small and Cottage Industry Corporation ▪ NGOs

ANNEX 4

LINKAGES OF THE KEY STRATEGIC GOALS TO KEY INTERNATIONAL AND NATIONAL DRIVERS FOR CHANGE

ELEMENTS OF DRIVERS	**GOAL 1:** PROFESSIONALISING THE DISASTER MANAGEMENT SYSTEM	**GOAL 2:** MAINSTREAMING RISK REDUCTION	**GOAL3:** STRENGTHENING INSTITUTIONAL MECHANISMS	**GOAL 4:** EMPOWERING AT RISK COMMUNITIES	**GOAL 5:** EXPANDING RISK REDUCTION PROGRAMMING	**GOAL 6:** STRENGTHENING EMERGENCY RESPONSE SYSTEMS	**GOAL 7:** DEVELOPING AND STRENGTHENING NETWORKS
United Nations Millennium Development Goals:							
Eradicate extreme poverty and hunger			✓	✓		✓	
Promote gender equality and empower women		✓		✓		✓	
Ensure environmental sustainability		✓		✓	✓		✓
Hyogo Framework for Action 2005-2015							
Integration of disaster risk reduction considerations into sustainable development policies, planning and programming at all levels.	✓	✓	✓		✓		
Development and strengthening of institutions, mechanisms and capacities at all levels, in particular at the community level.			✓		✓		✓

Systematic incorporation of risk reduction approaches into the design and implementation of emergency preparedness, response and recovery programmes in the reconstruction of affected communities					✓	✓	
ISDR Guiding Principles: National Platforms for Disaster Risk Reduction							
Increase public awareness to understand risk, vulnerability and disaster reduction globally				✓	✓		✓
Commitment from public authorities to implement disaster reduction policies and actions	✓	✓	✓				
Stimulate interdisciplinary and inter-sectoral partnerships; include the expansion of risk reduction networks					✓		✓
United Nations Framework Convention on Climate Change (UNFCCC)	✓	✓	✓	✓	✓		✓
Improve scientific knowledge about disaster reduction				✓	✓	✓	✓

PRSP Comprehensive Disaster Management towards Poverty Reduction and Growth: Policy Matrix key strategic goals:							
Mainstreaming Disaster Management and Risk Reduction into National Policies, Institutions and Development Processes		✓	✓		✓		✓
Strengthening disaster management and risk reduction capacity	✓				✓		✓
Ensuring knowledge management on disaster risk reduction	✓						✓
Enhancing community level capacity for disaster risk reduction				✓		✓	
Ensuring social protection of the most disadvantaged				✓		✓	

ANNEX 5
GLOSSARY OF TERMS

Adaptation: means the adjustment in natural or human systems in response to actual or expected climactic stimuli or their effects, which moderates harm and exploits beneficial opportunities.

Climate Change: means a change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.

Community Elements: at risk includes its structures, services, economic and social activities such as agriculture, commercial and service businesses, religious and professional associations and people.

Disaster: means a serious disruption to a community caused by the impact of an event that requires a significant coordinated response by the Government and other entities to help the community to recover from the disruption. Disasters are usually associated with severe damage to infrastructure and utilities, death, injuries and homelessness, and can be widespread or contained within a particular sector or sub sector.

Disaster Area: means a District, City Corporation, Upazila, Municipality, Union or any part of Bangladesh declared to be a Disaster Area under this Act.

Disaster Management: means arrangements for managing the potential adverse risks and includes defining the risk environment, managing the risk environment and responding to the threat environment.

Emergency Response Operations: means activities undertaken immediately before, during or after an event that help to reduce loss of life, illness or injury to humans, property loss or damage, or damage to the environment. It may include, for example, planning, co-ordination and implementation of measures to lesson the effects of a disaster upon members of the public or to protect any property of the state.

Hazard: means an event that has the potential to cause a disaster, and can be either natural (e.g. flood, cyclone, tsunami), human induced (e.g. chemical spill, fire), biological (e.g. SARS, Bird Flu) or technological in nature (e.g. nuclear generator failure). Hazards are not by definition disasters. Hazards include:

a. A cyclone, earthquake, flood, storm surge, nor'wester, tornados, tsunami, riverbank erosion, drought, landslide, hailstorm or other natural happening.
b. An explosion or fire, a chemical, fuel or oil spill, or a gas leak.
c. An infestation, plague or epidemic.
d. A failure of, or the disruption to, an essential service or infrastructure.
e. A process of organic origin or those conveyed by biological vectors, including exposure to pathogenic microorganisms, toxins and bioactive substances.

Mitigation – means the process of implementing measures that eliminate or significantly reduce the risks associated with potential hazards.

Natural Disaster –is a disaster (see definition of disaster) caused by the impact of a natural hazard.

Preparedness – means measures that are designed to ensure that communities will have the knowledge and understanding of their risk environment to enable them to better cope with potential hazard impacts.

Prevention – means activities undertaken to reduce or eliminate risk.

Relief: means money, food, medicine, shelter, clothes or any other assistance public or private provided to people and communities to overcome the effects of a disaster event.

Reconstruction: means the process of restoring affected infrastructure to its pre event condition.

Recovery: means measures that are designed to develop the systems required to support affected communities in the reconstruction of their physical infrastructure and restoration of their emotional, economic and physical well being.

Risk: means the measure of the likelihood of harmful consequences arising from the interaction of hazards, vulnerable community elements and the environment.

Risk Reduction: means the systematic process of defining and re-defining risk and managing risk.

Standing Orders on Disaster: means standing orders issued by the National Disaster Management Council under the direction of the Government.

Vulnerability: means a measurement of community elements at risk that are exposed to specific hazards, both natural and human induced, and that have a low level of resilience to cope with the impacts of that hazard or characteristics of that hazard.

ANNEX 6
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