Ministry of Food and Disaster Management

Government of the People's Republic of Bangladesh

Interim Report
Progress of HFA Implementation

31 May 2007

Abbreviation

ADB	Asian Development Bank
ADPC	Asian Disaster Preparedness Centre
BDPC	Bangladesh Disaster Preparedness Center
BDRCS	Bangladesh Red Crescent Society
BMD	Bangladesh Meteorological Department
BNBC	Bangladesh National Building Code
BRAC	An NGO
BUET	Bangladesh University of Engineering and Technology
BWDB	Bangladesh Water Development Board
CBO	Community Based Organization
CDMP	Comprehensive Disaster Management Programme
CEGIS	Centre for Geographic and Environmental Information Services
CFAB	Climate Forecast Applications project in Bangladesh
CFAN	Climate Forecast Applications Network
CFIS	Community Flood Information System
CNRS	Centre for Natural Resource Studies
CPP	Cyclone Preparedness Programme
CRA	Community Risk Assessment
CSSR	Collapsed Structure Search and Rescue
CUET	Chittagong University of Engineering and Technology
DAE	Department of Agriculture Extension
DIRA	Disaster Impact and Risk Assessment
DoE	Department of Environment
DFID	Department for International Development
DGPS	Differential Global Positioning System
DMB	Disaster Management Bureau
DMIC	Disaster Management Information Centre
DMC	Disaster management Committee
DPHE	Department of Public Health and Engineering
DRR	Directorate of Relief and Rehabilitation
DRRO	District relief and Rehabilitation Officer
ECNEC	Executive Committee for National Economic Counsel
EIA	Environmental Impact Assessment
ESCAP	Economic and Social Commission for Asia and the Pacific
EWDS	Early Warning Dissemination System
EWS	Early Warning System
FFWC	Flood Forecasting and Warning Center
FFW	Food For Work
GATECH	Georgia Institute of Technology
GIS	Geographic Information System
GO	Government Organization
HFA	Hyogo Framework for Action

HOPE	Hospital Preparedness for Emergencies
ICDDR,B	International Centre for Diarrhoeal Disease Research, Bangladesh
ICRRP	Inventory of Community Risk Reduction Programme
ICT	Information-Communication Technology
ICZM	Integrated Coastal Zone Management
IDRMR	Institute of Disaster Risk Management & Research
IMDMCC	Inter-Ministerial Disaster Management Coordination Committee
IWM	Institute of Water Modelling
LAN	Local Area Network
LGD	Local Government Division
LDRRF	Local Disaster Risk Reduction Fund
MIS	Management/Monitoring Information System
MoEF	Ministry of Environment and Forestry
MoF	Ministry of Finance
MoI	Ministry of Information
MoP	Ministry of Planning
MoFL	Ministry of Fisheries and Livestock
MoWCA	Ministry of Women and Child Affairs
MoWR	Ministry of Water Resources
NDRRP	Natural Disaster Risk Reduction Programme
NEC	National Economic Council
NGO	Non Government Organizations
PAOS	Program on Atmospheric and Oceanic Sciences
PLUS	Participatory Land Use Survey
PRA	Participatory Rural Appraisal
PRSP	Poverty Reduction Strategy Paper
RRAP	Risk Reduction Action Plan
SAARC	South Asian Association of Regional Cooperation
SDMC	SAARC Disaster Management Centre
SODM	Standing Order of Disaster Management
SPARRSO	Bangladesh Space Research and Remote Sensing Organization
SWOT	Strength Weakness Opportunity and Threat
TAPP	Technical Assistance Project Proforma
UNDP	United nations Development Programme
USAID	US Agency for International Development
UDMC	Union Disaster Management Committee
UzDMC	Upazila Disaster Management Committee
VGD	Vulnerable Group Development
VGF	Vulnerable Group Feeding
WCDR	World Conference on Disaster Reduction

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Part A

Cover Page

Reporting organization	Ministry of Food and Disaster Management (MoFDM), Government of the Peoples' Republic of Bangladesh
Scope of organization's mandate (e.g. national authority for disaster, NGO network)	National Coordinating body for Disaster Management
Country, region, or other area being reported on	Bangladesh
Reporting on own organization or on behalf of others-please state	Country progress
Contact officer	Mr. Dhiraj Malakar
Position	Secretary in-charge
Address, City, Postal Code, Country	Ministry of Food and Disaster Management, Bangladesh Secretariat, Dhaka - 1000
Phone	880-2-7167877, 7163464
Fax	880-2-7165405, 7174148
E-mail	info@mofdm.gov.bd
Website	www.mfdm.gov.bd

Part B

Summary Analysis

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 144 million people within its 147,570 sq. km territory. About one-fifth of the population lives within 19 coastal districts, in zones of multiple vulnerabilities and fragile ecosystem with distinctive development opportunities. More than 310 rivers and tributaries have made this country a land of rivers.

The geophysical 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 eastern 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, the high arsenic contents of ground water, water logging, water and soil salinity and various forms of pollution are the frequent occurrences Bangladesh used to face on a regular basis. These adversely affect the development of the country, as they result in the loss of lives, assets and infrastructure. The magnitude of poverty, increasing rural to urban migration and high population density accentuates the rising level of vulnerability to catastrophic episodes affecting life and livelihood. 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.

The traditional disaster management model focusing on disaster relief and recovery has done little to redress these rising levels of risk. Thus, the country has adopted a more holistic approach and set the following vision mission and objective:

Government Vision for Disaster Management:

To reduce the vulnerability of the poor to 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.

MoFDM Mission:

To bring a paradigm shift in disaster management from conventional response and relief practice to a more comprehensive risk reduction culture

Overall Objective:

To strengthen the capacity of the Bangladesh disaster management system to reduce unacceptable risk and improve response and recovery management at all levels

The disaster management programme of Bangladesh is designed around the following five strategic focus areas:

1. Professionalising the disaster management system
2. Mainstreaming of risk management programming (partnership development)
3. Strengthening of community institutional mechanisms (community empowerment)
4. Expanding risk reduction programming across a broader range of hazards
5. Strengthening emergency response systems (operationalising response)

2. The Summary of Key Initiatives and Their Achievements

Disaster Risk Reduction (DRR) is a new concept and the country was not well prepared to adopt this new concept neither the methodologies were readily available to ensure mainstreaming DRR across sectors and across hazards. As part of mainstreaming DRR as well as a follow-up to the 2005 WCDR, Bangladesh took a number of initiatives to achieve the country commitment to build the resilience of Nations and Communities to Disasters within the given timeframe. Section 3 elaborately described the government and other major initiatives under all the five priority action agendas, the results and achievements made so far through those initiatives, the challenges and learning and plans for near future.

In March 2004 the Ministry of Food and Disaster Management in collaboration with UNDP and DFID launched the comprehensive disaster management programme. The last two years since WCDR were spent to reorient the existing key disaster management players in the country on this new approach and also establishing the policy and planning frameworks. DRR has been included in the Bangladesh PRSP. Bangladesh took leadership and hosted an expert group meeting to formulate and establish the SAARC Regional Framework for Comprehensive Disaster Management designed around the five strategic focus areas and also aligned with the HFA

priority action areas. The Allocation of Business of MoFDM and its agencies is revised incorporating the DRR issues. MoFDM in consultation with national level stakeholders formulated the National Plan for Disaster Management 2007-2015. This is an umbrella plan which provides an overall guideline how to ensure mainstreaming DRR across hazards and sectors at all levels.

The country also developed a methodology called “Community Risk Assessment and Risk Reduction Action Planning Procedure” to identify, assess and analyse community specific risks to different hazards and sectors. This is a methodology which combines the scientific along with community knowledge and perception and historical data and information. This is a tool applied to prepare community level risk reduction action plans with active participation of primary and secondary stakeholders. As of now a total 267 union level (lower administrative tier of the government) risk reduction plans have been prepared.

According to available literature Bangladesh is the second most vulnerable countries to climate change impacts. Seasonal weather variations now-a-days are much prominent and in last few years an increased water crisis for irrigation in many parts of the country is observed. Exploring for livelihood adaptations to climate change is an area and for this Bangladesh through a intensive consultation with national and international experts formulated a strategy document for the National Adaptation Plan of Action. MoFDM through Department of Environment in partnership with FAO, DAE, and other technical agencies are conducting a number of action research to explore for suitable adaptive technologies as well as to test their adaptabilities.

Bangladesh over the years gained much experience to deal with flood and cyclone, but has no or limited capacity and preparedness to deal with mass scale disasters like earthquake, tsunami, etc. To improve the existing emergency response capacity the following initiatives have been undertaken:

- Launched the procurement of search and rescue equipment amounting Tk. 700 million (approx. US$ 10 million) of which 50% are government of Bangladesh contribution and the remaining 50% will come from the Government of Japan
- Formulated a National Tsunami Risk Reduction Action Plan
- Lunched the earthquake and tsunami preparedness programme under CDMP which will prepared earthquake risk and vulnerability maps for 3 mega cities (Dhaka, Chittagong and Sylhet) and contingency plans for tsunami preparedness for 10 coastal districts.
- Launched the initiatives to strengthen Bangladesh Fire Service and Civil Defence
- Launched initiatives to strengthen Bangladesh Meteorological Department and the Cyclone Preparedness Programme for improved early warning information and its early disseminations

3. The lessons learned

- Development of regulative framework with key administrative and legislative documents require long term programme with continuous efforts to prioritize and harmonise the disaster risk reduction issues in the government vision, mission and objectives.

- Changing the mind set and the long years practice takes time.

- Different Risk Reduction approaches are being practiced in the country by different organizations. Harmonization of approaches and standardizations of guidelines and thereby bringing them all in the same system is required.

- Preparation of risk reduction action plans through CRA process by engaging all players including the community vulnerable groups increased community ownership.

- Mainstreaming is a combination of a number of backward and forward interventions. It is about: a) Greater Advocacy - Awareness raising among Political, Senior Policy and Government Department Officials, Media and Academic Institutions; b) Policy and Planning Reforms; c) Capacity Building of the DMCs at all levels; d) Establishing collaborative partnerships; e) Establishing planning frameworks and f) Establishing uniform guidelines

- Mainstreaming disaster risk reduction across agencies and sectors requires a multiple interventions to bring on board all the key policy officials to improve their knowledge and understanding. For this an institutional mechanisms is required to establish.

Part C

Progress towards implementing the HFA

Priority for Action 1: Ensure that disaster risk reduction is a national priority with a strong institutional basis for implementation

The Bangladesh Initiatives

This section of the report describes the following Bangladesh initiatives have been undertaken since the WCDR relating to the above Action Agenda:

1.1. Mainstreaming Disaster Risk Reduction in the Poverty Reduction Strategies (PRSs)
1.2. Establishment of the SAARC Regional Framework for Comprehensive Disaster Management
1.3. Establishing the Bangladesh Disaster Management Regulative Framework

1.1. Name of initiative and programme: Mainstreaming Disaster Risk Reduction in the Poverty Reduction Strategies (PRSs)

1.1.1. Description, objectives, main activities of the initiative or programme

Since independence Bangladesh made commendable success in the social sector but the progress in terms of poverty reduction is not satisfactory, up to 1% per annum. Natural hazard impacts that result in a disaster situation are the primary cause and result of the slow rate of poverty reduction. Disaster adversely affect the poor than rich and therefore the cost to cope with any disaster is disproportionately higher for the poor who has limited income and asset and mostly depends on wage labour.

Thus mainstreaming disaster risk reduction across sectors has been considered as one of the key policy agenda in the Bangladesh poverty reduction strategy paper (PRSP) to sustain the development results. The final PRSP included one separate policy matrix on "*Comprehensive Disaster Management Towards Poverty Reduction and Growth"* which identified the followings actions agenda for the 2005-2007 period:

- 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

1.1.2. Results and achievements made, with indicators if available:

Attached below table provides the update on the implementation of the Policies included in Poverty Reduction Strategy Paper (PRSP)

Table 1. Progress Update on the implementation of Policy Matrix 7: Comprehensive Disaster Management towards Poverty Reduction and Growth

Strategic Goal	Key Targets	Actions taken/Underway (as of February 2007)	PRSP Policy Agenda (FY05-FY07)	Future Priorities	Responsibilities
(1)	(2)	(3)	(4)	(5)	(6)
1. Mainstreaming disaster management and risk reduction into national policies, institutions and development process	• Introduce disaster management and risk reduction as a component of all ongoing and future development plans, programmes, policies and projects. • Inclusion of disaster risk management within the development project validation process through Disaster Impact and Risk Assessment (DIRA) in addition to EIA • Factor vulnerability impacts, and adaptation to climate change into disaster management and risk reduction plans, Programmes, policies and projects • Projecting future activities and growth targets incorporating risk scenario and reduction options	• Comprehensive Disaster Management programme (CDMP) has reached mid term and on track to meeting overall goals and objectives. • Draft Disaster Management Plan prepared and received endorsement from the IMDMCC • SAARC Regional Framework for Disaster Management established and modelled on Bangladesh disaster management framework. • Government agency focal points established to drive mainstreaming process. • Established Working Committee to identify the sectoral intervention for mainstreaming risk reduction • Ministry of Agriculture has introduced a Nationwide Program "Risk Reduction against drought" in 146 upazila of the country. •	• MoFDM being recognized as a key partner in development planning and policy making process (such as NEC, ECNEC, Economic Affairs Council etc. • Development project appraisal process includes application of disaster and climate change and risk management • Incorporate climate change risk reduction and adaptation into national disaster risk reduction activities through CDMP, NAPA and other linkages • Disaster Impact and Risk Assessment (DIRA) incorporated into Development Project Proposal (DPP), and Technical Assistance Project Proforma (TPP). • Advocacy and public awareness for social	• Capacity building for government sector to promote benefits of risk reduction. • Determination of micro level climate change impacts and the establishment of information databases to enhance community risk assessment. • Promote the National Plan for Disaster Management 2007 – 2015 among government and development partners to ensure its implementation. • Support the establishment and operationalization of the SAARC Regional Framework. • Greater level advocacy to ensure implementation of local level risk	MoP; MoF MoFDM

Strategic Goal	Key Targets	Actions taken/Underway (as of February 2007)	PRSP Policy Agenda (FY05-FY07)	Future Priorities	Responsibilities
(1)	(2)	(3)	(4)	(5)	(6)
		• Negotiations underway with NGO Affairs Bureau to mainstream risk reduction within NGO programmes. • Climate Change (Macro) impacts integrated within Community Risk Assessment (CRA) and Risk Reduction Action Planning processes. • Climate change modelling and research underway to determine micro level impacts. • First round of media awards presented for best story on risk reduction. • Advocacy strategy promoting risk reduction implemented targeting media and academic institutions. • Actions underway to mainstream disaster risk reduction issues in the Education Curriculum under Nation Curriculum and Text Book Board	mobilization • Strengthen relevant planning capability	reduction action plans prepared through CRA process • Establishment of monitoring and evaluation framework	
2. Strengthening disaster management and risk	• Build capacity and strengthen national institutions for disaster management with	• Draft Disaster Management Act prepared and submitted for review and endorsement • Draft Disaster	• Enact laws and formulate rules for expansion of mandates of MoFDM • Formal Govt.	• Pursue the finalisation of key policy documents. • Undertake capacity building to enhance	MoA, MoFL, MoH, LG D; MoEF, MoF, MoFDM, MoWR,

Strategic Goal	Key Targets	Actions taken/Underway (as of February 2007)	PRSP Policy Agenda (FY05-FY07)	Future Priorities	Responsibilities
(1)	(2)	(3)	(4)	(5)	(6)
reduction capacity	emphasis on preparation of action plans across all stakeholder guidelines	Management Plan prepared and received endorsement from the IMDMCC • MoFDM Allocation of Business revised and awaiting final endorsement • Standing Orders on Disaster Management being revised • Learning and Development Strategy for MoFDM and DoE Climate Change officers drafted. • Professional development programme for 43 government officials implemented through a range of national, regional and international strategies. • Training needs assessment undertaken for Disaster Management Committees and programme implemented through partner agencies.	approval and gazetting of Act, Policy and Plan • Enhance professional skills and knowledge of key personnel on risk reduction, preparedness, warning and forecasting system, climate change risk reduction and post-disaster activities • Prepare Plan of Action (PoA) for Policy implementation with clear delineation of responsibilities • Revise Allocation of Business in relation to MoFDM Mandates • Revision of Standing Orders on Disaster Management in line with Comprehensive Risk Management Approach • Creation of a Calamity Relief Block Fund	knowledge and understanding of policy change impacts. • Implement professional development programme in accordance with approved Learning and Development Strategy. • Progressive expansion of disaster management training strategy. • Provide regular and adequate budgetary support to DMCs commensurate with their assigned roles and responsibilities	DPHE, Bangladesh Meteorological Department, SPARRSO, Red Crescent Society
3. Ensuring knowledge management (acquiring,	• Identification and dissemination of indigenous knowledge and best	• Disaster Management Information Centre established and being progressively strengthened	• Upgrade the capacity in risk assessment information management during	• DMIC Standing Operating Procedures (SOP's) to be developed and	MoFDM, MoP, MoF, MoSW, MoWCA, MoWR, MoA,

Strategic Goal	Key Targets	Actions taken/Underway (as of February 2007)	PRSP Policy Agenda (FY05-FY07)	Future Priorities	Responsibilities
(1)	(2)	(3)	(4)	(5)	(6)
storing, sharing and applying) on disaster risk reduction	practices • Establish a Disaster Management Information Centre (DMIC) • Establish strong local, regional and international networks among stakeholders • Establish an Institute of Disaster Risk Management & Research (IDRMR)	through databases and other information networks. • Formal partnerships being progressively established with information providers • Flood forecasting and warning and cyclone warning systems in place	normal and emergency periods • Strengthen capacities for risk assessment for flood, cyclone, drought, river bank erosion, pest attacks, earthquake, epidemics , including assessment of climate change risk • Strengthen networks for timely development of resources • Strengthen operational response capacities • Establish an Institute of Disaster Risk Management & Research • Establish strong local, regional and international networks among stakeholders • Establish a Disaster Management Information Centre (DMIC) • Developing an interacting Risk Reduction Website	validated through exercises prior to the onset of the flood season. • Greater focus to be given to Urban Risk and particularly that related to earthquake. • Undertake feasibility study on the need for disaster management training and research institute. • Develop a national disaster management training plan and policy. • Expand information networks and databases on an all hazards basis.	MoFL, MoH, LG D, MoEF, DPHE, BMD, SPARRSO, all District and Thana level Offices, Union level local govermment representatives, NGOs, CBOs, CSOs, Schools and academic organisations, Local government Bodies, NGOs, CBOS
4. Enhancing	• Strengthening	• Developed through pilot	• Identification and	• Support the	MoFDM, Local

Strategic Goal	Key Targets	Actions taken/Underway (as of February 2007)	PRSP Policy Agenda (FY05-FY07)	Future Priorities	Responsibilities
(1)	(2)	(3)	(4)	(5)	(6)
community level capacity, for disaster risk reduction (community level preparedness, response, recovery and rehabilitation)	Mechanisms to build capacities for the Community and Institutions at all levels • Community based Programming for risk reduction	testing the Community Risk Aassessment (CRA) Guideline and Risk Reduction Action Planning (RRAP) processes • CRA and RRAPs are under full implementation through sub-contracting arrangements with NGOs. • Achieved high level of community involvement in CRA processes and determination of risk management options. • Roles and responsibilities of disaster management committees revised and be incorporated within new Standing Orders on Disaster Management. • Expansive ICT training programme implemented for all MoFDM staff including field officers. • LAN/WAN network established within the MoFDM wings and with BMD including field offices. • Made funding available to document and disseminate indigenous best practice • Disaster management in school curriculum being revised	dissemination of Indigenous best practices • Undertake programmes to the capability of people to cope with natural disasters • Revising School curricula on Disaster management in line with disaster risk reduction approach • Roles and responsibilities of Disaster Management Committees (DMCs) needs revision in line with disaster risk reduction approach • Enhance capacity through learning and applying community based risk mapping and assessment • Flood forecasting and warning centre should provide more disaggregated information • Promote livelihood strategies and option for poor that incorporates disaster	resourcing of community based risk reduction programmes identified thropugh the CRA and RRAP processes. • Create all hazards awareness programmes to increase knowledge of risk and understanding of actions to manage risk. • Expand the focus of risk reduction down to the household level through the development of Household Action Plans. • Develop a range of risk indicators and awareness strategies to ensure a proactive response to emerging threats such as Cold Wave and Monga. • Expansion of CRA and RRAP programme.	Government Bodies NGOs, CBOs, CSOs Disaster Management Committees

Strategic Goal	Key Targets	Actions taken/Underway (as of February 2007)	PRSP Policy Agenda (FY05-FY07)	Future Priorities	Responsibilities
(1)	(2)	(3)	(4)	(5)	(6)
		• Implementing a number of small scale projects to explore and promote different livelihood adaptation options	management and risk reduction practices • Emergency support should serve the needs of the vulnerable groups • Build capacities of the Disaster Management committees at all levels • Strengthen local, regional and national coordination mechanism • Establish an internet based network of communication and information sharing • Establish electronic based management and information system • Reduce/eliminate leakage • Construct academic building cum flood shelters in 272 flood-prone upazilas		
5. Ensuring social protection of women,		• Considerations for vulnerable groups included within the CRA process.	• Emergency support should serve the needs of the vulnerable groups	• Develop a national damage and loss estimation systems that considers the	MoFDM, Local Government Bodies NGOs, CBOs,

Strategic Goal	Key Targets	Actions taken/Underway (as of February 2007)	PRSP Policy Agenda (FY05-FY07)	Future Priorities	Responsibilities
(1)	(2)	(3)	(4)	(5)	(6)
children, elderly, people with disability and other vulnerable groups against vulnerability and risk			• Promote and facilitate the incorporation of longer term disaster risk reduction due to climate change into disaster management	specific needs of vulnerable groups.	CSOs Disaster Management Committees
6. strengthening governance in the sector		• Comprehensive training programme being progressively implemented to create facilitating environment for effective disaster management. • Developed and implementing an introductory Disaster Management Training Module to strengthen the capacities of DMCs at all levels of 7 selected pilot districts. • Establishment of the policy, planning and regulative framework underway • Established the SAARC Framework for Comprehensive Disaster Management • Central Relief Management Information	• Build capacities of the Disaster Management Committees at all levels • Strengthen local, regional and national coordination mechanism • Establish an internet based network of communication and information sharing • Establish electronic based management and information system • Reduce/eliminate leakage	• Finalise policy documents and initiate training and advocacy programme. • Strengthen monitoring and evaluation system. • Conduct regular review meetings with key stakeholder groups from among government and NGO's. • Develop and establish monitoring and evaluation systems	MoFDM, Local Government Bodies, NGOs, CBOs, CSOs Disaster Management Committees

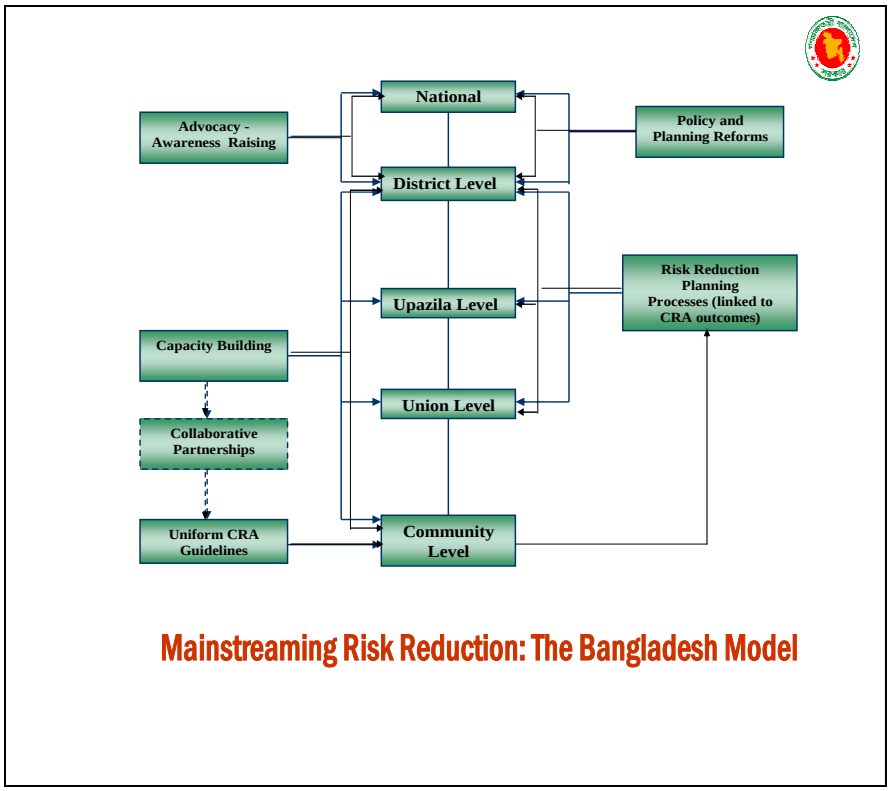
Strategic Goal	Key Targets	Actions taken/Underway (as of February 2007)	PRSP Policy Agenda (FY05-FY07)	Future Priorities	Responsibilities
(1)	(2)	(3)	(4)	(5)	(6)
		System under development			
Emergency & disaster management and Gender Issues					
Ensure social protection for women against vulnerability and risks	• Increase post-disaster rehabilitation especially targeted to women	• The approved by IMDMCC national plan for disaster management 2007-2015 provides the guideline to address specific needs of women and the disadvantages groups in emergency response management • Gender mainstreaming policy for all disaster management and risk reduction initiatives being drafted	• Emergency support (relief, etc.) should be women friendly • Provide special support to disaster affected female headed households	• Finalise and implement the gender mainstreaming policy and establish effective monitoring mechanisms to ensure conformity. • Comprehensive social protection programme including nutrition, health and sanitation, and housing needs to be taken up	MoFDM, MoWCA, MoI

1.1.3. Major challenges and lessons learned in implementing the initiative or programme, and next steps planned

Although PRSP was prepared for three years, the approval process took quite substantial time and thereby delayed the implementation for one year. Recently government has approved to extend its timeframe upto 2008.

Public-private partnership is found the key to ensure implementation of the policy strategy being adopted in PRSP. MoFDM is closely working with both the government and private sector organizations as well as with the donors to establish a planning and implementation mechanism.

MoFDM Adopted a holistic approach for mainstreaming which is a combination of a number of backward and forward interventions. It is about: a) Greater Advocacy - Awareness raising among Political, Senior Policy and Government Department Officials, Media and Academic Institutions; b) Policy and Planning Reforms; c) Capacity Building of the DMCs at all levels; d) Establishing collaborative partnerships; e) Establishing planning frameworks and f) Establishing uniform guidelines



Mainstreaming disaster risk reduction across agencies and sectors requires a multiple interventions to bring on board all the key policy officials to improve their knowledge and understanding . It has taken a lot of efforts to communicate and to influence MoFDM and its agency staff and will require major efforts to influence main sector ministries, as they often do not have a focus for risk reduction. Ministry of Agriculture has been brought under CDMP progarmme through livelihood adapatation to climate change- a sub component of the CDMP. A campaign of briefings and requests for focal

points in each ministry is being planned for the second half of 2007 to deal with this.

Under the SAARC Disaster Management Framework for action (2006-2015) a human resource development programme and ifnromation sharing has ben initiated to mainstream the risk reduction initiaves in SAARC region.

1.2. Name of the initiative or programme: Establishment of the SAARC Regional Framework for Comprehensive Disaster Management

1.2.1. Description, objectives and main activities:

South Asia with its population of about 1.3 billion is one of the regions in the world highly exposed to a variety of natural as well as human induced hazards such as floods, drought, cyclones, earthquakes, tsunami, ground water arsenic contamination and river erosion. Countries in the region experienced a number of major disasters[1] in the last one and a half decade which took lives of about half a million people and caused huge economic loss and massive destruction in the countries' economy. Among others the major reasons in increasing vulnerability of people in the region is largely related to the demographic conditions, rapid technological and socio-economic changes, fast expanding urbanization and development within high risk environment. Recurring disasters pose a great development challenge for all SAARC countries and therefore the need for formulation of a SAARC Regional Framework of Action on Comprehensive Disaster Management was first discussed in the SAARC Technical Committee meeting on Environment and Forest held in Thimpu on 11-12 June 2004. The Bangladesh proposal of hosting an expert group meeting in Dhaka on "Formulating a Comprehensive Framework on Disaster Management and Disaster Prevention" was also agreed in that meeting. The 13th SAARC Summit endorsed this idea and called for elaboration of a Comprehensive Framework on Early Warning and Disaster Management. This is also aligned with the implementation of the Hyogo Framework of Action where all the UN Member States participated in the WCDR in Kobe demonstrated their global commitment to disaster risk reduction in the context of development.

The adaptation of Hyogo Framework for Action created a worldwide momentum in the design and implementation of disaster risk reduction activities. In 7-9 February 2006, Bangladesh hosted an expert group meeting to formulate the "Disaster Management in South Asia: A Comprehensive Regional Framework for Action (SFA) 2006-2015". Bangladesh drafted the framework which was modelled around CDMP's five strategic focus areas and is aligned with the HFA five priority action areas. The draft was finalized in the expert group meeting and then endorsed by the SAARC Environmental Ministers' Meeting in May 2006.

[1] *Major disasters in the region - Bangladesh flood in 1988, 1998, 2004 and cyclone in 1991, 1997; cyclone in Orissa (1999, earthquake in Latur (1996) and Gujrat (2001) of India; the Asian Tsunami in December 2005 and Muzaffarabad Earthquake (2005), Pakistan.*

Objectives

The Framework provides a platform for South Asian countries to:

1. Establish and strengthen the regional disaster management system to reduce risks and to improve response and recovery management at all levels;
2. Identify and elaborate country and regional priorities for action;
3. Share best practices and lessons learnt from disaster risk reduction efforts at national levels;
4. Establish a regional system to develop and implement regional programmes and projects for early warning;
5. Establish a regional system of exchanging information on prevention, preparedness and management of natural disasters;
6. Create a regional response mechanism dedicated to disaster preparedness, emergency relief and rehabilitation to ensure immediate response; and
7. Create a regional mechanism to facilitate monitoring and evaluation of achievements towards goals and strategies.

Expected Outcome

1. An efficient Disaster Management System;
2. Mainstreaming disaster risk reduction into the development policies and practices of the government at all levels;
3. Disaster resilient communities that have enhanced coping capacities in relation to all hazards;
4. Development of policies and programmes that recognizes all risks to the communities, and mitigation strategies that are based on a risk management assessment;
5. Greater levels of coordination and cooperation at national, regional and international levels; and
6. Enhanced information, warning and reporting systems within governments at all levels.

Strategic goals

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

Priorities for Action

a. Develop and implement risk reduction strategies
b. Establish Regional and National Response Mechanisms
c. Establish a Regional Information Sharing and Develop Network of Institutions and Organizations
d. Develop and implement Disaster Management training, education, research and awareness programmes
e. Apply the ICT for disaster management.
f. Establish an effective monitoring and evaluation mechanism.

As stated in the framework document all the member countries shall develop their own plan of action for implementation of this framework. The regional cooperation components of this framework shall be implemented by the concerned regional mechanisms.

1.2.2. Results, achievement made with indicators if available:

As a follow-up to that the SAARC Disaster Management Centre (SDMC) is established in New Delhi, India. The governing body of the SDMC was also established and meetings were held. Human resource development in SAARC countries was given priority in order to proceed for a comprehensive disaster risk reduction approach.

Following SAARC Framework structure Bangladesh prepared its National Plan for Disaster Management 2007-2015 which is already approved by the inter-ministerial Disaster Management Coordination Committee in February 2007. The plan, once approved by the cabinet, will be shared with the SAARC member countries

1.2.3. Next Steps

- Sharing the country action plans among SAARC Member countries
- Bangladesh committed to host another expert group meeting in this year to harmonize the national plans and identify the regional issues for mutual support and interest.

1.3. Name of the initiative or programme: Establishing the Bangladesh Disaster Management Regulative Framework – The MoFDM Initiative

Implementing Agency**: MoFDM**

1.3.1. Description, objectives and main activities:

Bangladesh is currently going through a process of significant policy, legislation and planning reform in the field of disaster management. This reform is based around a paradigm shift that will see risk reduction move from conventional response and relief to a more comprehensive risk reduction culture. The overall objective of this reform is to reduce the vulnerability of people, especially the poor, to the effects of natural, environmental and human induced hazards to a manageable and acceptable humanitarian level.

The reform includes establishment of a disaster management regulative framework under which the activity of Disaster Risk Reduction and Emergency Management in Bangladesh will be managed and implemented. The framework includes the following:

1) Revision of the Allocation of Business of the Ministry and its agencies to reflect

- 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 and
- MoFDM mission to bring a paradigm shift in disaster management from conventional response and relief to a more comprehensive risk reduction culture and to promote food security as an important factor in ensuring the resilience of the communities to hazards.

2) Enacting a Disaster Management Act 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.

3) Formulation of the National Disaster Management Policy 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.

i. **Formulation of the National Disaster Management Plan** in line with the SAARC Framework as well as the HFA to be effective for 2007-2015.

5) Revision of the Standing Orders on Disasters in line with the current policy guideline and the established frameworks

6) Development of specific guidelines for Government at all levels to assist Ministries, NGOs, disaster management committees and civil society in implementing disaster risk management.

7) Establishment of a learning and professional development strategy to strengthen the disaster management capacity of MoFDM and its agency staff

Figure 1 shows the inter-linkages between various regulative instruments and programming for implementation.

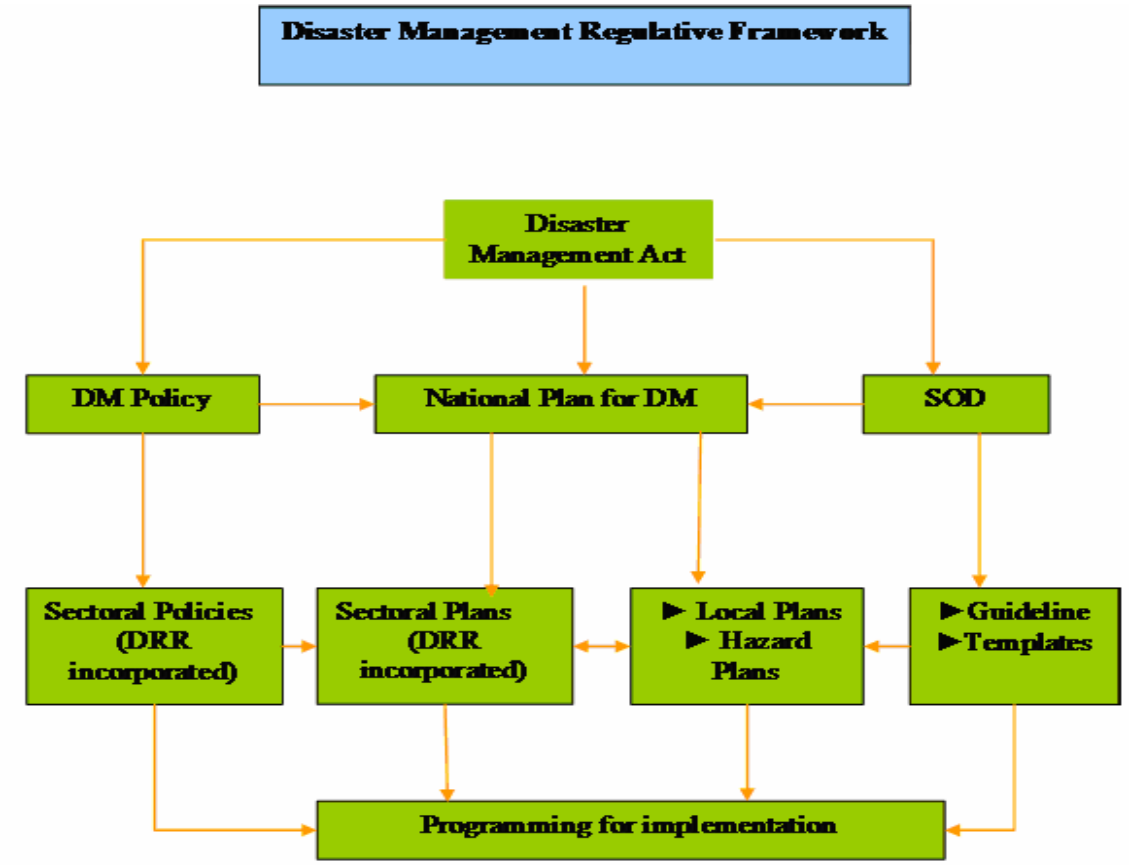


Figure 1: Disaster Management Regulative Framework

1.3.2. Results, achievement made with indicators if available:

- The Allocation of business of MoFDM has been revised. This is under Cabinet approval process
- Disaster Management Act redrafted and awaiting approval process
- Established a policy and planning framework under which MoFDM Corporate Plan for 2005-2009 and 3 years Strategic Plans for Disaster Management Bureau, Directorate of Relief and Rehabilitation and Directorate General of Food published in 2005.
- The Bangladesh National Plan for Disaster Management 2007-2015 has been drafted and received inter-ministerial disaster management coordination committee endorsement. This is an umbrella plan which 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 MoFDM 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 Paurashava and City Corporation of the country. Figure 2 below presents the disaster management planning framework in Bangladesh:

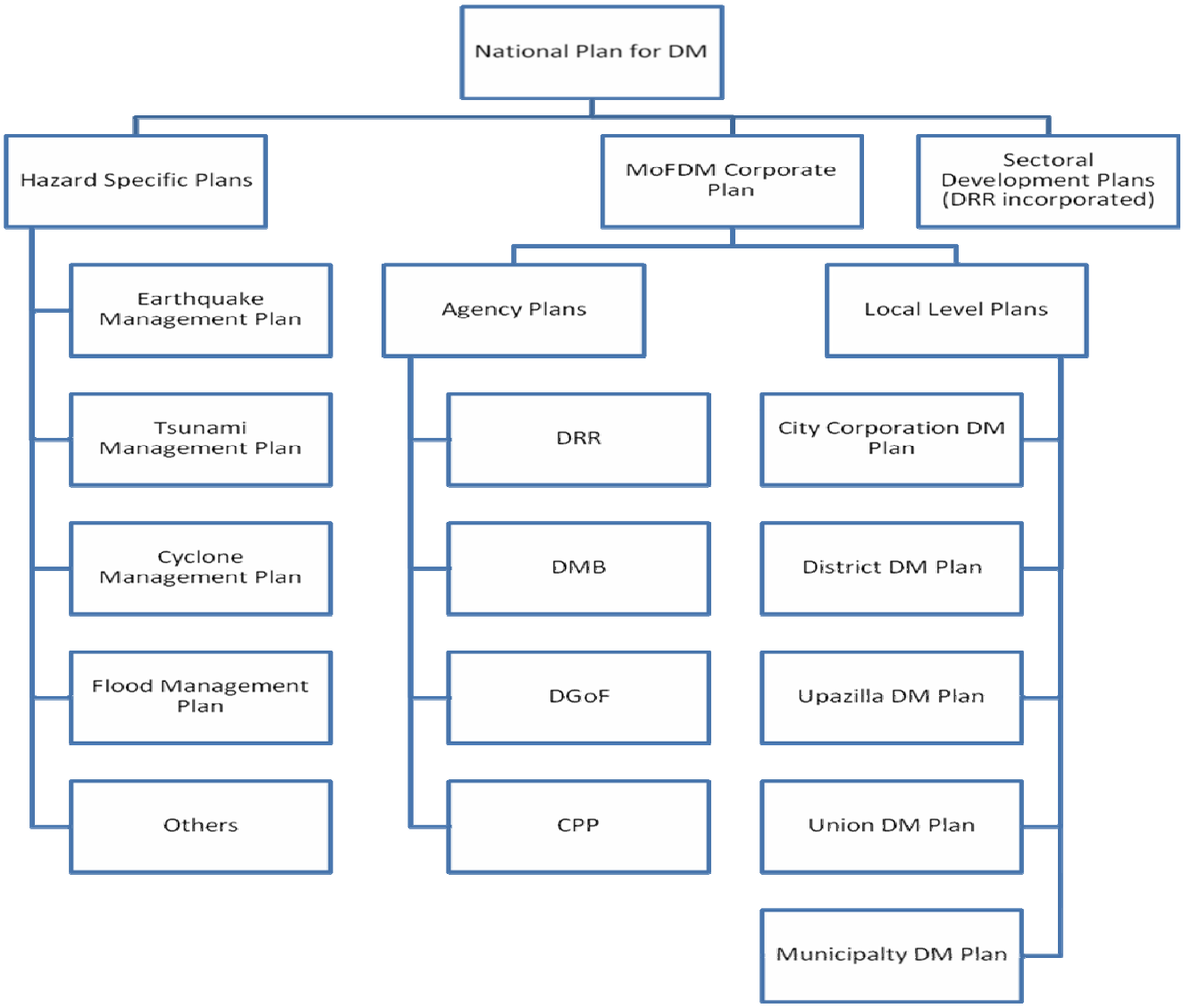


Figure 2. Bangladesh Disaster Management Planning Framework

- Produced version 4 of the revised SODM to be finalized through inter-ministerial consultation
- Drafted the Learning and Professional Development Strategy. 43 government officials attended professional certificate course on disaster management at BRAC University, Bangladesh, Swinburne University, Australia and ADPC, Bangkok

1.3.3. Major challenges and lessons in implementing the initiative or programme, and next steps planned:

Development of regulative framework with key administrative and legislative documents require long term programme with continuous efforts to prioritize and harmonise the disaster risk reduction issue in the government vision, mission and objectives. Frequent changes of government officials not only delay the whole process but require additional effort on their orientation and high level influence.

Development and compilation of local level plans will require substantial time and resources. A high level commitments and inter-agency collaborations are required to ensure implementation of the local level plans and thereby improve the community safety.

Priority for Action 2: Identify, assess and monitor disaster risks and enhance early warning

The Bangladesh Initiatives

This section of the report describes the following Bangladesh initiatives have been undertaken since the WCDR relating assessing and monitoring community risks and vulnerabilities and strengthening early warning and community systems:

2.1. Inventory of Community Risk Reduction Programmes: The MoFDM Initiative under CDMP
2.2. Applying Participatory Approach for Community Vulnerability and risk Assessment in disaster management
2.3. Climate Change modeling in Bangladesh
2.4. Flood Forecast Technology for Disaster Preparedness in Bangladesh
2.5. Strengthening Cyclone Preparedness Programme
2.6. Strengthening Bangladesh Metrological Department (BMD)
2.7. Establishing the Disaster Management Information Network
2.8. Community Flood Information System (CFIS), Bangladesh
2.9. Early Warning System (EWS) Study
2.10. LDRRF to fund Small Scale Initiatives to Strengthen Community Safety and
2.11. Tsunami Risk Management - The MoFDM Initiative

2.1. Name of the initiative and Programme: Inventory of Community Risk Reduction Programmes: The MoFDM Initiative under CDMP

Implementing Agency: **CDMP, Ministry of Food and Disaster Management**

2.1.1. Description, Objectives and Activities:

The project 'Inventory of Community Risk Reduction Programme (ICRRP)' was implemented under CDMP framework to prepare a database containing the inventory of ongoing, recently completed and proposed community risk reduction initiatives.

The study was initiated with a view to prepare a comprehensive database on PPRR (Prevention, Preparedness, Relief and Rehabilitation) activities in seven pilot district as well as nation level for assessment of state of programmes and capabilities of the respective key stakeholders.

Objectives:

The objective of this study was to produce a thorough inventory of ongoing, recently completed and proposed community risk reduction initiatives of major players active in the field of disaster management and risk reduction in Bangladesh.

The specific objectives of the project were:

- Review of existing initiatives of risk reduction in Bangladesh, which includes initiatives, activities, and areas of operation, approach, methods and tools of operation used by relevant organization.
- Identification of resources, which include organizational capacity, institutional structure, organization, software tool availability and use etc.
- Development of inventory database and prototype MIS on Risk Reduction Programs for all hazards.

Activities:

The major activities of the project were (i) preparation of ICRRP at national and seven pilot district level, (ii) Risk and Hazard, SWOT (Strength, Weakness, Opportunities and Risks/Threats) and Gap analysis and, (iv) prototype GIS based MIS development.

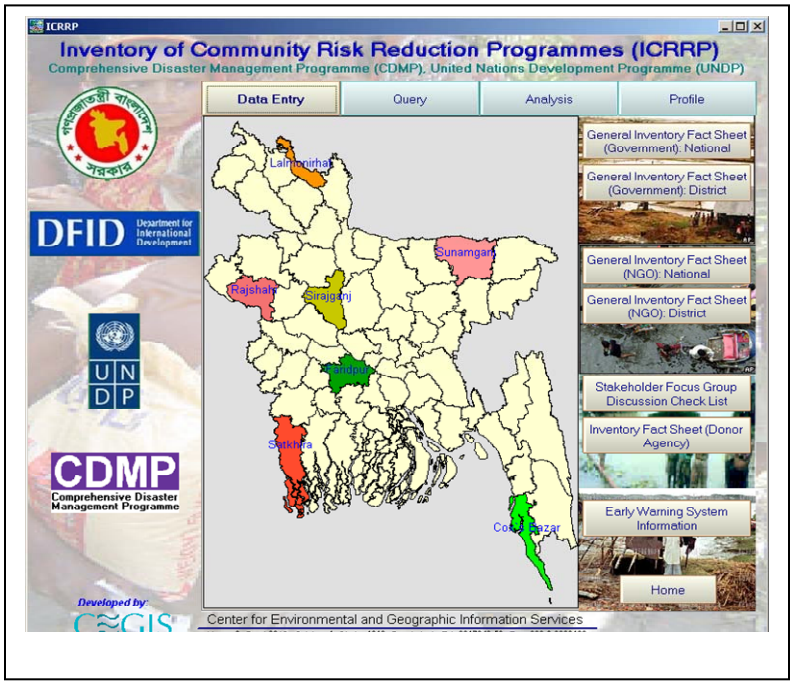
Under the project ICRRP, information were collected from more than 50 national level and more than 200 district level organizations in seven pilot districts namely Cox's Bazar, Faridpur, Lalmonirhat, Rajshahi, Satkhira, Sirajganj, Sunamganj through structured questionnaire survey, agency visits and consultation workshops.

The SWOT analysis produced a comparative analysis of the status of various attempts, capacities and methods of the institutions working in the field of disaster risk management. The multi-hazard multi-risk approach was the central focus of the SWOT analysis.

Another important activity exercised under this study was *hazard and risk* mapping, this has been done as pilot basis in Rajshahi district. An important product of this study was a GIS based prototype MIS for helping the planners and decision makers to fetch the inventory different summarized information on organizational capacity and PPRR activities.

2.1.2. Results and achievements:

The study results showed that over 80 and 60 percent organization work with flood and cyclone respectively, out of which 30 percent are purely government initiatives at national level, where as at district level 50 percent organizations are NGOs. Most of the organizations are engaged in flood, cyclone and erosion hazards managements. About 50 percent GO organizations are engaged in prevention activities whereas only 20 percent organizations are involved in preparedness.



The SWOT and GAP analysis results with multi-hazard and multi-risk approach confirmed that, out of 52 national level organizations 10 organizations are working with prevention, 33 organizations are working with preparedness, 15 organizations are working with relief and 18 organizations are working with rehabilitation activities. The SWOT analysis also revealed that among 38 National level GO and NGO organizations, 32 organizations have adequate Management strength; 13 have weakness in availability of Skill Resources; 18 have the opportunity of Improved Institutional

Mechanism. The social and political conflicts were identified as threat to 7 organizations. Among seven pilot districts, management and skill resources was found as the key strength, availability of fund was found as weakness, improved institutional mechanism/coordination was found as opportunity and the social and political conflicts were found as risk/threats.

2.1.3. Major challenges and lessons learnt:

In course of the present study, it was observed that some national level organizations have carried out hazard mapping up to upazila level in a pilot study area but district or local level organizations are not involved in any hazard mapping or analysis. Local level hazard analysis and mapping is very important to strengthen community level risk reduction programs. The community level hazard analysis will help to update the national level hazards analysis and mapping.

Most of the national organizations carried out risk assessment using participatory methods. Modern technology based approaches like GIS based assessments and modeling and indicator based assessments are applied for hazards like floods, erosion, tidal surges, cyclones, tornadoes, and tsunami by few technical agencies.

In the present study found lacking a countrywide risk assessment for multi-hazard environment. Limited use of modern technology in risk assessment exercise was observed at district level organizations. Weaknesses in risk assessment of the community level organizations comprise lack of skilled manpower, policy, technology, network with national organizations and available fund.

2.1.4. Next Steps

- convert the off-line database to web base format with a provision for future regular updating
- explore for funding opportunities to expand the database to other high risk districts

2.2. Name of the initiative and Programme: Applying Participatory Approach for Community Vulnerability and Risk Assessment in disaster management

Implementing Agency: **Directorate of Relief and Rehabilitation through CDMP**

2.2.1. Description, Objectives and Main activities:

Vulnerability is a combination of a person or group, expressed in relation to hazard exposure, which drives from social and economic condition of the individual, family or community concerned. CDMP with inputs from the national and international experts developed an uniform methodology called "Community Risk Assessment (CRA) and Risk Reduction Action Planning (RRAP) Procedure " to assess community risks and vulnerabilities and prepare the community specific risk reduction action plans by utilizing the available scientific information as well as the historical data generated through community consultations with different vulnerable groups. CRA and RRAPs play an important role in assisting communities and disaster management committees to identify "all hazards" risks, together with the most appropriate range of risk reduction options that can be introduced to either eliminate or reduce risk to a more manageable level.

The existing participatory approaches used by the agencies for community vulnerability and risk assessments grossly vary across agencies and mainly rely on historical data and do not consider the future climatic risks information generated through scientific research.

The CRA and RRAP guide that ensure appropriate consideration of both traditional and scientific factors are therefore viewed by the majority of stakeholders as being a common sense approach to addressing the issue of community risk.

CRA is defined as a participatory process for assessing hazards, vulnerabilities, risks, ability to cope, preparing coping strategies and finally preparing a risk reduction options implementation plan by the local community. CRA uses scientific information and predictions and participatory discourses to identify, analyse and evaluate risk environment of a particular community, reach consensus amongst the community on actions that are needed to manage the risk environment. The method recognizes that the vulnerability, loss, reduction or mitigation strategy and coping mechanism vary from community to community and group to group (women, person with disability, landless, farmers-fisher folks, etc) of a same community. So it ensures representation of professional, community and other groups and that

their points of views are reflected. CRA encourages community participants to respect others' concerns.

CRA is a comprehensive method to be used by organisations involved in hazard management and risk reduction activities particularly the CDMP and its partners where participation is a central consideration. It is also relevant to organisations involved in community based planning and management at local, regional or national levels.

The guide is a refresher for those who have already been trained in PRA approaches, disaster risk assessment and mitigation planning. It is a basic guide for those who wish to learn about and practice CRA.

Objectives:

The followings are the specific objectives of vulnerability and risk assessment in disaster management:

- The approach to be more participatory and people centered
- The development of multi-sectoral action plan for future implementation
- To improve the access to local available resources
- Community contribution to the national development programme focusing through risk reduction process in disaster management.
- The approach incorporate scientific prediction and information to identify risks into participatory process.

Followings are the key steps suggested in CRA and RRAP preparations:

- Community profiling (identify elements, resources, crops, infrastructures, community capacity and disaster experiences)
- Identify hazards (using scientific prediction, climate change modeling and traditional experiences and perception of people)
- Identify vulnerabilities (identify sector, elements in each sector and level of vulnerabilities of each element)
- Determine risks
- Prioritize Risk
- Causal analysis of risks
- Identify risk reduction options

2.2.2. Results and achievements:

The CRA and RRAP procedure, as bottom up approach, received wide acceptance. Here communities are considered to be the best judges of their own vulnerability and hazardous risks. They can make the decisions regarding the best suitable options for reduction of the risks identified.

CRA and RRAP procedure has established a socio-economic and gender analysis framework under which the socially disadvantaged groups receive priority and are involved in the planning process as effective change agents, rather than as beneficiaries.

As of April 2007, CDMP in partnership with NGOs completed CRA and RRAP process in 267 unions and accordingly prepared 267 union level risk reduction action plans where more than 25,000 community people including women, people with disability, landless, occupational groups representatives and 6900 members from the Disaster Management Committee (DMC)'s were participated. These plans will be compiled to upazila and district level plans and the respective DMCs will be ultimately responsible for their implementation.

2.2.3. Major challenges and lessons learnt:

In preparing the CRA reports for implementing the action plans through the active participation of community people, a greater challenge was faced by the programme management team. The followings are the challenges and lesson learnt to meet up the challenges:

Challenges

- Mind shift of the key players in the Disaster Management Field, particularly among the government decision makers,
- Different Risk Reduction approaches are being practiced in the country by different organizations, harmonization of approaches and standardizations of guidelines and thereby bringing them all in the same system,
- CRA is a recent innovation and lack adequate expertise in the country,
- Lack of expertise among NGOs to utilize technical tools and data, such as GIS images and climate change information in risk assessments
- To ensure active participation of all segments of community people in CRA and RRAP process
- Involvement of local government institutions (i.e. union parishad) as the stakeholder of the programme.

Lessons learned

- Minimization of local political pressure and motivation of stakeholders was a great challenge to complete the task to achieve the target.
- Lack of scientific information and models especially the climate change models and information at micro level.
- Active participation of women and union disaster management committee had a greater impact in preparing the appropriate action plan.
- Appropriate training to the NGO partners and close supervision and monitoring is the key to ensure timely delivery of quality output. The partner organization has contributed substantially with a strong commitment in completing the task in time.
- The different dimensions of social and economic vulnerability are difficult to illustrate through this process.
- An overall challenge is to review and document how risk assessments have contributed to modify risk and how they are being utilized in the decision-making process.

2.2.4. Next steps

- Finalize the guideline incorporating the lessons learnt
- Greater publicity to ensure wider use nationally and internationally
- Preparation of Upazila and district level risk reduction action plans through compilation of union level CRA and RRAPs
- Establishment of a computer based database on the union, upazila and district level RRAPs to be made available to the interested key players in the Disaster Management Field
- Design and implement an advocacy programme to ensure greater participation of relevant sectoral ministries in thsynergies among sectoral implementation of the risk reduction Use the data to do broader advocacy in order to bring synergy in the relevant Ministries & Sectors, International NGOs and resource mobilization too.

2.3. **Name of the initiative and programme:** Climate Change modeling in Bangladesh

Implementing Agency: **Climate Change Cell's, Department of Environment through CDMP**

2.3.1. Description, objectives, main activities of the initiative or programme

Bangladesh is already experiencing climate related hazards like floods, droughts, cyclones and others which are being aggravating following climate change (and variability). A significant part of the coastal region is threatened by salinity intrusion and submersion due to sea level rise. The general predictions are: more floods, untimely floods, more droughts, drainage congestion, salinity intrusion, more cyclones with higher intensities.

To understand climate impacts and risks, some key questions need to be answered: Will these hazards become more frequent and intense? Will their magnitude increase? Which locations are most vulnerable? When will hazards occur? And what shall be possible impacts? For example: A farmer would like to know likely precipitation patterns while planning his crop calendar, preparing his land, sowing, harvesting, etc. Obviously the development practitioners, professionals and policy makers need to gather this knowledge to provide extension and other services to the primary stakeholders. Worldwide, modeling provides useful scenarios of impacts of climate change in seeking answers to the questions.

The Climate Change Cell of the Department of Environment under the Comprehensive Disaster Management Programme organized a Workshop on Climate Change Impact Modeling at BIAM Foundation, Dhaka, during 26-27 February 2006.

Collective works pursued during the workshop has been analyzed and is being presented in this document. Specific needs of different sectors from the impact modelling exercise to pursue 'sustainable climate resilient development' have been compiled. Activity based modelling presentations in the workshop indicated what different modelling exercises could offer to meet these needs. It became clear that climate modelling, water modelling and application modelling are necessary to support a 'climate resilient development' process. Another milestone finding of the workshop was that the quality of the data from BMD and BWDB used for calibration of climate modelling as a baseline data needs to be improved.

Following the workshop further consultations were held with the institutions and professionals engaged in the modelling activities. Discussions with the professionals and institutions focused on two major areas:

- ✓ Output formats including spatial (e.g. used mesh size in the model) and temporal (e.g. defined spells over the seasons) resolutions; compatibility of climate models with water models and application models in practice in the country.

- ✓ Developing profiles of the relevant modelling institutions including capacity, experience, exposure, networking and willingness to achieve and contribute in this regard.

It became evident that there is a need to establish institutional homes separately for climate modelling, water modelling and application modelling. Each of the modelling exercise requires input and contribution from a number of organizations for each model and partnerships have to be strengthened and/or developed. And again institutional arrangements have to be established among institutional homes so that output from climate modelling could be utilized as input for water and application modelling.

The profile of the model practicing institutions reveals that BUP could be considered for housing climate change models with BUET as technical associate, BMD and BWDB as model developing associate, SMRC as regional associate and IPCC as international associate. IWM could be home for water modelling with WARPO and SPARSSO as technical associate, BWDB, and BUP as model developing associate, SMRC as regional associate and DHI as international associate. CEGIS could be home for application modelling with BARC as technical associate and IWM and BUP as model developing associate. It should be mentioned that these arrangements can be adjusted over time. Rather these are initial arrangements with an open approach, as the capacity of the modelling practice shall increase in the country and new professionals and institutes shall emerge and shall join the team in any areas relevant to. All the institutions involved in climate change impact modelling shall adopt latest technology and customized for the country.

In the context of overall risk management the climate risk management is a substantial area to deal with. Accordingly modelling shall provide us present climate hazards and trends (past hazards) for specific water systems and corresponding livelihood systems shall allow us to assess climate risks at this point in time and shall be used in risk reduction initiatives of the country. There shall also be climatic hazards scenarios following global warming at local level which shall be used to initiate risk reduction initiatives in the coming future. These hazards scenarios shall also be used to deal with climate risk management in the development process of the country.

The vision is to establish an integrated climate change impact modelling approach to incorporate climate risk management in the development process of the country for ensuring safety of human lives and properties. However, the mission is outlining pathways for climate change (and variability) modeling matching development needs and

existing modelling practices, strengthening capacity where needed and establish institutional arrangements that shall ensure appropriate impact scenarios to the development stakeholders in Bangladesh

The following business plan is suggested to operationalize the roadmap following business plan shall be followed. The Climate Change Cell intends to carry forward the activities of the business plan from now through 2008. However, policy advocacy for mainstreaming shall continue beyond.

2.3.2. Business plan

- ✓ BMD base line (1961 to 1990) precipitation and temperature data quality improvement
- ✓ Acquire localized hazard trends for seven CDMP districts to support Community Risk Assessment and Action Plan Development and initiate Local Disaster Risk Reduction
- ✓ MoU among the modelling homes and CDMP
- ✓ MoU among partners of specific models
- ✓ Validation runs PRECIS with improved data
- ✓ Validation runs RegCM with improved data
- ✓ Comparative analysis of validation results for PRECIS and RegCM
- ✓ Outline training plan for climate modelling
- ✓ Training module development for climate modelling
- ✓ Capacity building training for climate modelling
- ✓ Localized precipitation and temperature scenarios through modelling for CDMP districts
- ✓ Localized climatic hazard scenarios through biophysical and application modelling for CDMP districts
- ✓ Policy advocacy for mainstreaming use of climatic modelling products for development persuasion by all relevant agencies
- ✓ MoU among modelling house and development agencies
- ✓ Streamlined and mainstream use of modelling products down the road

This road map has been finalized addressing written comments and suggestions and sharing and discussing and incorporating all aspects with the modelling community in a meeting held on 18th June 2006 at DoE.

Incorporating all aspects with the modelling community in a meeting held on 18th June 2006 at DoE.

2.4. Name of initiative and programme**:** Flood Forecast Technology for Disaster Preparedness in Bangladesh

Implementing Agency: **Asian Disaster Preparedness Center (ADPC), Bangkok, Thailand and Climate Forecast Applications Network (CFAN), Georgia, USA.**

2.4.1. Description, objectives, main activities of the initiative or programme

Natural disasters cause immense suffering and loss of life every year in Bangladesh, and they can have a devastating long term impact on National Development. Floods are more frequent and can have a cumulative impact, each incident causing further loss of resilience both in the environment and in society. Much of the country is flooded every year and agriculture system to a large extend have been adapted to this normal flooding. However, early floods in May, June, more than normal peak floods in July, August and late floods extending in September has negative impact on food crop production potentials. Major such damaging floods occurred during 1974, 1987, 1988, 1997, 1998, 2000 and 2004. Due to 1998 flood 10 – 20 % of the total food crop production was lost.

Recent studies of coping mechanisms of poor households in the event of natural hazards indicate that individual coping responses have limited effectiveness. Widespread disinvestments of livestock and borrowing resorted to meet household food needs during disasters that lead to debt trap. Recurring natural hazards, the floods in particular, undermine development efforts of Bangladesh and aggravate poverty.

The flood forecasting system in Bangladesh is in the state of continuous development since 1972. The Flood Forecasting and Warning Center (FFWC) issues only 72 hours lead-time predictions of rise/fall of the levels of water in various rivers of the country during the monsoon season.

In order to reduce vulnerability to climate hazards in agriculture and water resources, and to mitigate the disastrous effects of floods through the generation and application of climate and flood forecast information, the US Agency for International Development's Office of Foreign Disaster Assistance (USAID/OFDA) supported the Climate Forecast Applications project in Bangladesh (CFAB) from 2000 to 2003. CFAB project was managed by the Program on Atmospheric and Oceanic Sciences (PAOS) at the University of Colorado and the Earth and Atmospheric Sciences of the Georgia Institute of Technology (EAS/GATECH), USA, which engaged in research aimed at increasing the lead-time of flood forecasting in Bangladesh. The Asian Disaster Preparedness Center (ADPC) based in Bangkok, Thailand, which identified broader forecast application opportunities and sought for the institutionalization of the project in Bangladesh. The project involved participation of stakeholders in Bangladesh such as the Bangladesh

Meteorological Department (BMD), Flood Forecasting and Warning Center (FFWC), Bangladesh Water Development Board (BWDB), Department of Agriculture Extension (DAE). The CFAB project specifically aimed to:

- Develop forecasting schemes for Bangladesh floods that add predictive skills to current efforts within Bangladesh,
- Develop resilient schemes that will be able to take advantage of improvements in data availability, predictive modeling, data assimilation, etc.,
- Promote international cooperative efforts that will provide data and tools necessary for the prediction schemes, noting that flood forecasting techniques require substantial technological investment and infrastructure,
- Develop an infrastructure within Bangladesh that will make use of the forecasts and will eventually own the prediction schemes, and
- Work actively with partners in Bangladesh to facilitate a rapid technological transfer

To further strengthen the above efforts, USAID has sanctioned a multi-year (2006 – 2009) project entitled "Flood Forecast Technology for Disaster Preparedness in Bangladesh" for development of three-tier (1-6 months; 20-30 days and 1-10 days forecasts) forecast technology and transfer them to Bangladesh institutions such as BMD and FFWC. The project is being implemented by Asian Disaster Preparedness Center (ADPC), Bangkok, Thailand with support from Climate Forecast Applications Network (CFAN), Georgia, USA.

The project objectives and expected results are:

Project Objective 1: Forecast technology tested and transferred, and capacities developed to operationalize the forecast systems within Bangladesh. It is expected that BMD and FFWC will be technically and technologically capable of handling its own climate and flood forecasts and make decisions that will allow remedial actions to be taken.

Project Objective 2: Sustainable end-to-end generation and application of flood information established through pilot projects at selected sites, showing measurable improvements. This involves participatory identification of floods – related problems, and communication of forecast products to end users.

The activities for objective 1 include development and testing of forecast technologies and transfer to national organizations such as Bangladesh Meteorological Department (BMD) and Flood Forecasting and Warning Centre (FFWC) in close collaboration with Climate Forecast Application Network (CFAN), Georgia, USA and ADPC. The other activities are training module development on climate/flood forecast technology and training delivery. The activities for objective 2 include participatory problem identification, vulnerability analysis, institutional analysis, facilitating local and national

level working groups, communication of climate/flood forecast products to local community and capacity building. The project has been implemented since March 2006 and all the implementing partners were engaged in completing their respective tasks.

The participating international organizations included Asian Disaster Preparedness Centre (ADPC), Bangkok, Thailand, Climate Forecast Application Network (CFAN), Atlanta, Georgia Tech University, USA. The national agencies and institutions included Institute of Water Modelling (IWM) and Centre for Geographic and Environmental Information Services (CEGIS), CARE-Bangladesh, Dhaka, Bangladesh. The major stakeholder organizations included Bangladesh Water Development Board (BWDB), Bangladesh Meteorological Department (BMD), Department of Agricultural Extension (DAE), Disaster Management Bureau (DMB) of Ministry of Food and Disaster Management (MoFDM), Dhaka Bangladesh.

2.4.2. Results and achievements made with indicators

The three tier forecasting system was developed which provides forecasts of regional precipitation and Ganges and Brahmaputra river discharge into Bangladesh on three overlapping time scales:

- 1-6 months: "Broad brush" estimates of regional rainfall and Brahmaputra (B) and Ganges (G) river discharge into Bangladesh (collectively B+G and individually B and G). Forecasts are issued every month for 6-month periods. The purpose of these forecasts is to provide information for strategic planning for agriculture and allied sectors and also for disaster preparedness.
- 20-30 days: Forecasts of regional rainfall and river discharge (B and G) on 20-30 days time scale provides forecasts for 5-day average periods (pentads) centered at 5, 10, 15, 20, 25 and 30 days. Forecasts are issued every 5 days and are used to allow both strategic and tactical decisions in the agricultural, water resources and disaster management sectors. There are currently two versions of the 20-30 day forecasts schemes: Mode I which is the current version and which provides only a single forecast at a particular time in the future (say 20, 25. days) and Mode II (under development) which provides a probabilistic forecast as in the 1-10 day scheme described below.
- 1-10 day forecasts: Issued daily for 1-10 days providing probability forecasts of regional precipitation and river discharge. These forecasts have been rendered to provide probability of flood level exceedance at the entry point of the G and B into Bangladesh. The forecasts have been incorporated into the GoB Flood Forecast and Warning Centre (FFWC) forecasts river routing model on an experimental operational basis.

Over the past years of its implementation, the project has achieved the following:

- Testing of long-term (1-6 months) forecast schemes. Historical data were used to initialize the long-range flood forecasting scheme. Results of the test indicated that major flood years could be predicted months before their occurrence – for example, the 1998 floods would have been forecast three months before their occurrence, giving sufficient lead time for anticipatory actions.

- Development of new medium-term (20-25 days) forecast scheme. A new statistical scheme for the prediction of rainfall (and river discharge) into Bangladesh has been developed, providing potential application for disaster management, particularly for the management of floods.

- Establishment of skill of short-term (1-10 days) flood forecasts. The project has showed that short-term forecast can be extended from the current 2 days to nearly 10 days. This increase in lead time will allow emergency planning, and selective planting or harvesting to reduce potential crop losses at the beginning or end of the cropping cycle.

- Forecast evaluation. The short range (1-10 days) forecast was evaluated during 2006 season for 18 locations in Bangladesh.

- Forecast application. A method to bridge the gap between producers and users of forecasts has been developed through the generation of user friendly forecast products that provides an aggregated risk analysis to aid a user community in making absolute decisions.

- Five pilot districts in Bangladesh were selected to test the forecast value. Site profiling, livelihood characteristics, options were identified to tailor forecast products for application.

- Capacity building training programmes was organized to improve the understanding of the operational forecasters on data base management, forecast product development, incorporation of CFAB forecast in existing FFWC short range forecast scheme.

The project performance evaluation of Experimental Hydrological Forecasts, Experimental Meteorological Forecasts, Application for Agriculture Risk Management and Disaster Risk Management has demonstrated its potentiality and applicability in Bangladesh.

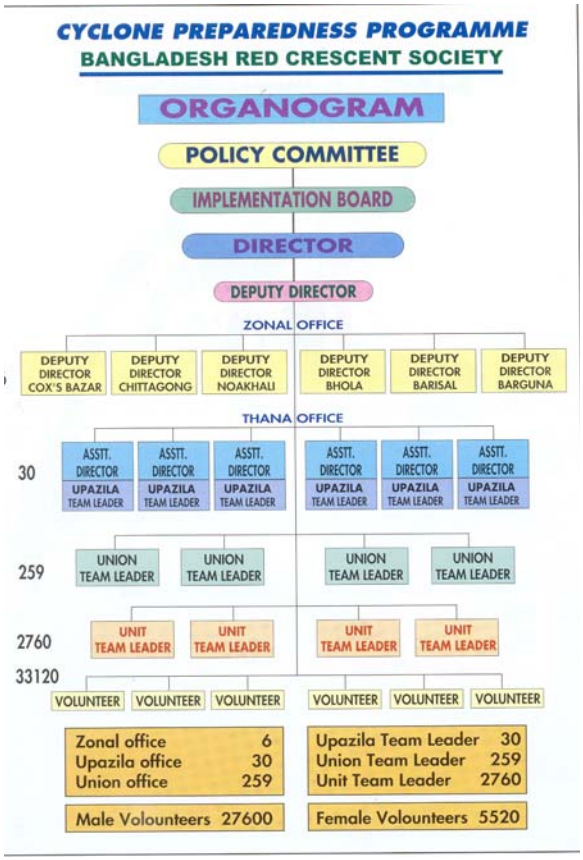
2.4.3. Next steps planned.

- transfer of technology to FFWC and BMD at the end of 2007
- operational three-tier forecast development from FFWC
- Application of forecasts at local levels in selected pilot districts
- Development of forecast products for flash flood and ensamble rainfall forecasting schemes

2.5. Name of the Initiative**:** Strengthening Cyclone Preparedness Programme

Implementing Agency: **MoFDM through CDMP**

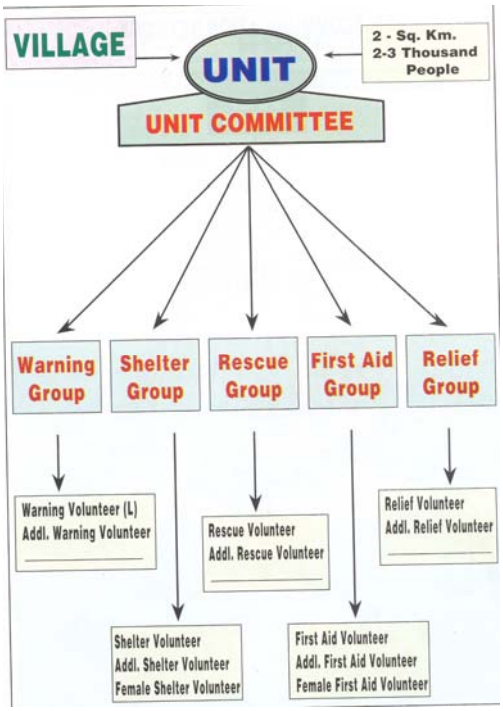
2.5.1. Description, objectives, main activities of the initiative or programme



Following the devastating cyclone in November 1970, the Bangladesh Red Crescent Society (BDRCS) and the League of Red Cross and Red Crescent Societies were asked by the United Nations General Assembly to establish the Cyclone Preparedness Programme (CPP) with the aim of minimizing loss of life and damage to property in coastal communities vulnerable to cyclonic activity by strengthening the capacity in disaster management of the coastal people of Bangladesh. Currently the programme is being co-funded by the BDRCS and MoFDM. It is the Ministry of Food and Disaster Management, is the key component of the nation's institutional early warning system and represents one of the most successful initiatives in early warning in the South-East Asian region.

The specific objectives of CPP are:

1. To develop and strengthen the disaster preparedness and response capacity of costal communities vulnerable to cyclones,
2. To increase the efficiency of volunteers and officers,
3. To maintain and strengthen the CPP warning system and ensure effective response in the event of cyclone.



CPP trained about 33,000 volunteers who are working in 11 coastal districts and responsible for the followings:

1. Disseminate cyclone warning signals issued by the Bangladesh Meteorological Department (BMD) to the community people.
2. Assist people in taking shelter,
3. Rescue distressed people affected by a cyclone,
4. Provide First Aid to the people injured by a cyclone,
5. Assist in relief and rehabilitation operations,
6. Assist in the implementation of the BDRCS Disaster Preparedness Plan,
7. Assist in participatory community capacity build-up activities,
8. Assist in the co-ordination of disaster management and development activities.

CPP staff provides scheduled daily weather reports via and extensive high frequency (HF) radio transmitting stations operated by volunteers throughout the coastal region of Bangladesh. In the mid-80^{s} CPP initiated a complimentary disaster preparedness programme to promote community participation in the construction and maintenance of cyclone shelters.

2.5.2. **Results and achievements**

To further strengthen the technological capacity of CPP for cyclone and tsunami early warning dissemination and emergency response, MoFDM through CDMP provided the following equipments:

Name of Equipment/item	Quantity	Comments
Personal Computer	9	3 PC for Headquarter, for 6 zonal offices at : Chittagong, Cox's Bazar, Noakhali, Bhola, Barisal and Barguna
Notebook Computer	1	For Headquarter. At present there is no notebook in CPP
BTTB Tel Connection	6	For 6 zonal offices at : Chittagong, Cox's Bazar, Noakhali, Bhola, Barisal and Barguna
Fax	6	For 6 zonal offices at : Chittagong, Cox's Bazar, Noakhali, Bhola, Barisal and Barguna
LAN	1	For Headquarter. At present there is no LAN in CPP

Name of Equipment/item	Quantity	Comments
Photocopier	1	For Headquarter. At present there is only one photocopier but it is too old
Printer	6	For 6 zonal offices at : Chittagong, Cox's Bazar, Noakhali, Bhola, Barisal and Barguna
Network Printer	1	For Headquarter. Essential for printing through LAN
Transistor Radio, AM/FM (High Quality)	500	For 500 units out of 2,760 unit
Torch Light (Solar/hand wind rechargeable)	500	For 500 units out of 2,760 unit
Super Megaphone	259	For 259 units out of 2,760 unit
Hand Siren	500	For 500 units out of 2,760 unit
Life Jacket	1500	For 1,500 volunteers out of 34,000 volunteers
Rescue Kit	500	For 500 units out of 2,760 unit
First Aid box	500	For 500 units out of 2,760 unit
Solar Panel	30	For existing VHF/HF

Disaster Management Bureau under CDMP also provided a number of capacity building training to all the CPP officials and its unit office volunteers on Tsunami Risk Reduction.

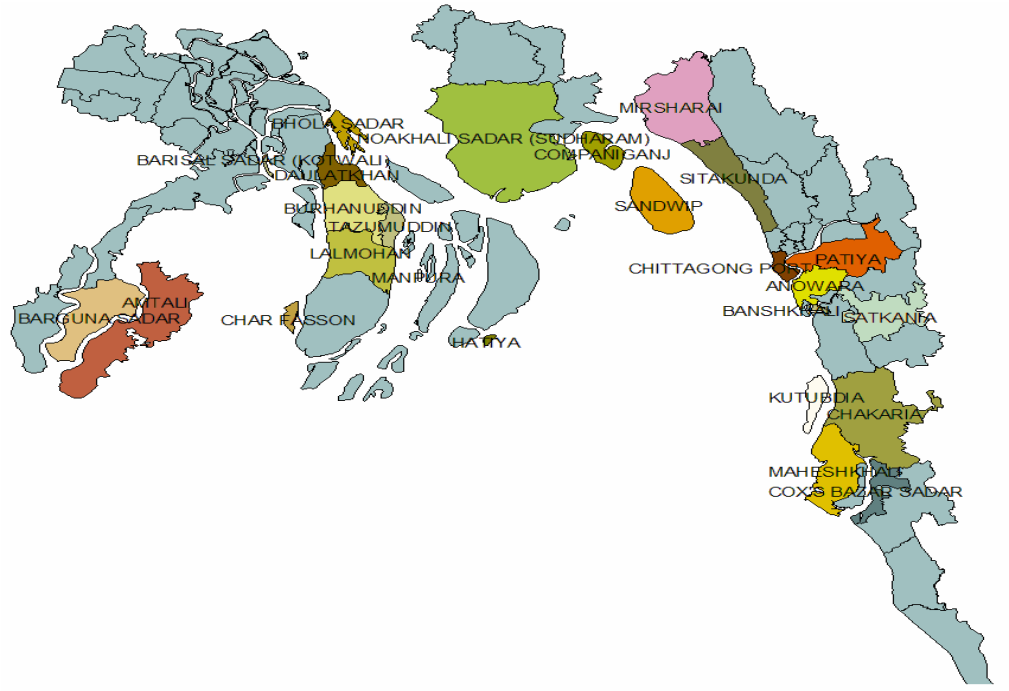


Figure 1: CDMPs working area for CPP

2.6. Name of the Intervention**:** Strengthening Bangladesh Metrological Department (BMD)

Implementing Agency: **MoFDM through CDMP**

2.6.1. Description, objectives, main activities of the initiative or programme

The Bangladesh Meteorological Department (BMD) is the source of all primary information in the meteorology and seismic domains and has the mandate to generate and disseminate early warnings of cyclones and tsunami to concerned agencies, and through the Cyclone Preparedness Program (CPP) to the entire coastal zone population. The BMD has met its mandate well, having provided early warnings of cyclones for more than 40 years. Advances in technology recently available in Bangladesh provide opportunities to enhance BMD's operations to world-class performance. To further strengthen BMD MoFDM through CDMP provided the following equipment to BMD:

Name of Equipment	Quantity
Personal Computer	42
B/W Laser Printer	42
UPS	42
Scanner	42
Generator	42
EDGE modem	10
GP SIM for EDGE Facility	10
Dialogic Fax Card	2

At the primary stage these equipments will be used to computerize 39 met observatory station of BMD and will replace the SSB system eventually.

2.6.2. Results and achievements

The above package of technical assistance is provided to BMD by DMIC of CDMP with the financial assistance from the United Kingdom Department for International Development (DFID). For this an MoU between CDMP, Ministry of Food and Disaster Management and BMD, Ministry of Defence was signed in November 2006 to ensure decrease duplication of effort for early warning dissemination, encourage distribution of the information to a large population of recipients and will minimize the average time between generation and delivery. It will establish for the Ministry of Food and Disaster Management (MoFDM) an up-to-date source of weather, climate and seismic observation data that are important inputs to risk reduction action planning. The agreement in general promotes the exchange of information and fosters communication between agencies in Bangladesh. It will help DMIC to achieve its goal to promote disaster management information sharing and will improve the communication capacity of BMD.

As per the MOU

- BMD will provide to DMIC all of its weather forecast bulletins and early warnings, as soon as they are made available. DMIC will disseminate the messages according to the required distribution, immediately on receipt.

- BMD will provide to DMIC, on request, archived meteorological datasets sufficiently disaggregated to distinguish district and seasonal differences, for purposes including but not limited to: Community Risk Assessments and Climate change research

- BMD will provide to DMIC, on request, such seismic data that it has available, for purposes including but not limited to: Community Risk Assessments and Seismic vulnerability research

- DMIC will help the BMD to develop a website in their domain bmd.gov.bd with the following purposes:
    - publicize BMD services and benefits to the country
    - make useful, understandable and timely BMD information products available on line
    - provide contact information of BMD staff

- DMIC will help BMD to establish protocols for daily delivery of meteorological predictions in suitable formats to mass media organizations including Bangladesh Television, Bangladesh Betar and newspapers.

2.7. Name of the Initiative: Establishing the Disaster Management Information Network

Implementing Agency: **CDMP of MoFDM**

2.7.1. Description, objectives, main activities of the initiative or programme

To enhance disaster management coordination through improved facilities and information sharing capacities the Disaster Management Information Centre of the Ministry of Food and Disaster Management is established. DMIC is an integral part of CDMP and MoFDM aimed at

- Establishing and making operational the national DMIC linking with the all 64 District DMICs
- Development of an Information Strategy, identification of user/s, their information needs and DMIC information products.
- Developing a process of building capacity within the MoFDM to produce required information products.
- Mapping out main sources of information relevant to vulnerability and disaster management.
- Designing and Dissemination of Information Products.
- Equipping DMIC with Information-Communication Technology (ICT) capability to facilitate effective information management during normal and emergency periods.
- Training of MoFDM staff on ICT under a single Professional Development Plan.
- Develop, validate and implement preparedness, response and relief management systems based on the All Hazards model.
- Develop a Damage and Needs Assessment Methodology and implement within response planning systems.
- Develop an All Hazards community warning system
- Strengthen national and regional networks.
- Providing information Services to relevant stakeholders (scientific information for those who wants to conduct CRA, sit-rep to emergency response stakeholder, warning messages to early warning dissemination stakeholders)

2.7.2. Results and achievements made with indicators

- With DFID support equipments supports were provided and communication links have been established with all the 64 districts Relief and Rehabilitation Offices.
- Conducted a technical and operational needs assessment
- Developed a DMIC ICT strategy
- Received an additional funding from the EC to expand the network to 235 high risk upazilas and to pilot the network at the community and household level
- Drafted the Standing Operating Procedure for DMIC

2.7.3. Major challenges and lessons in implementing the initiative or programme, and next steps planned;

Challenges and lessons learned

- Cultural gap, traditional paper base work vs. ICT
- Zero ICT knowledge at the field level
- Poor nationwide infrastructure
- Providing Scientific Information Services is very critical (availability, data validation, data ownership, procedures, cost)
- Uses of warning messages by District Disaster Management Committee or DMIC at District is yet to be strengthen

2.7.4. Next Steps

- Operationalization of DMIC
- Design and implement the information products
- Expand the network to 235 high risk upazilas and establish the links
- Pilot one full network down to the community and household level

2.8. Name of Initiative and Programme: Community Flood Information System (CFIS), Bangladesh

Implementing Agency: **Riverside Technology, Center for Environment and Geographic Information Services (CEGIS), and Bangladesh Disaster Preparedness Centre.**

Duration: From 2001 to 2006

Funded by: USAID

2.8.1. Description of the Programme:

Bangladesh is experiencing flood since long time. To reduce the loss of properties, several flood management initiative are going on in the name of preparedness, prevention, relief and recovery programmes throughout the country. From long experience, it is understood that preparedness activities could be better solution to reduce casualties and losses. at this end in view, improving the flood forecasting system got higher priority.

Convention flood forecasting system in Bangladesh is maintained by Flood Forecasting Warning Center (FFWC), which is based on climatic data and water level in main rivers only. FFWC provide flood forecast information for 48 hours lead time and disseminate through radio and TV only. But people living in floodplain require more specific information flood for their locality so that they can take preparedness measures properly.

In this context, CFIS programme was developed with the goal of providing people more localized flood forecasting information through best use of local technology.

Objectives

The objective of CFIS is to disseminate information on the flood extent, duration and depth of water / water levels to the community before the flood occurs.

Major Activities

The CFIS Project developed GIS-based flood forecasting information software named WATSURF, which implements a correlation model of a 248 km^2 study area. WATSURF is a simple gauge-to-gauge correlation-based tool that uses forecasted water levels from the FFWC as input. The calculated water levels are then used to generate flood water levels in the study area using GIS technology. WATSURF has its limitations due to its simple computational method including the calculated water levels are mainly reliable when there is full connectivity of floodwaters on the floodplain and are sensitive to backwater effects.

The CFIS Project, Bangladesh Disaster Preparedness Centre (BDPC) and local non-government organisations disseminated flood warnings derived from WATSURF to three pilot mouzas in Tangail district. Selected individuals in the community serve as the operators to receive a daily text message with flood warnings and operate the flag system and bulletin board to inform the community of the flood warning. The message and symbols were designed with active participation of the local people. The conceptual diagram of the CFIS is shown in following Figure 1.

The CFIS project raised awareness amongst local people about the flood forecasts and warnings. Flood warnings were conveyed to local people by change agents and volunteers who explained the implications and interpretation of different types of warnings and helped with flood preparedness. Flood management committees were formed involving local elites, local government elected representatives and officials, and non-government organizations.

The CFIS dissemination model varied slightly from the dissemination model used by EMIN. For example,

2.8.2. Results and achievements

CFIS relied entirely on local volunteers to disseminate flood information. Correlation between the predicted, actual and community-perceived water levels has been good, leading to use of the information by villagers in three pilot mouzas during the pilot development phase.

Based on this study CFIS project developed strategies for replication of this approach to other flood prone areas. The replication will require close coordination of FFWC and other agencies, such as DMB, and will require strong ties to users in the local government and communities. CFIS showed that local organizations are capable of supporting the disseminating flood warnings to all socio-economic groups.

The CFIS project has demonstrated success toward its main goals of generating flood information for the Bangladesh floodplains and of enabling access to the information by local governments and communities for use in flood preparedness activities. Since the initiation of the CFIS project, there has been increased awareness and interest among government agencies, donors and projects in community disaster preparedness. At this time, the beginning of the final two years of the CFIS project, there is a great interest in the CFIS concept and results, and there is an opportunity to leverage CFIS into larger and more comprehensive programs that are being launched by the government and development partners.

2.8.3. Major Challenges and Lessons

The major challenges in implementing the CFIS project include the following issues:

- Sustainability of high technology
- Motivation of local government and community

- Usefulness of short-term forecasting
- Local contextualization

Lessons learned from CFIS are as follows:

- Use of modern mobile communication technology for community level flood forecasting can be effectively implemented
- Community based flood forecasting can substantially reduce damage of properties
- Coordination of FFWC, BMD and local government would be the key issue to sustain CFIS programme.
- Wider replication of CFIS is required to improve the system.

2.8.4. Future Plan

In future, CFIS could be extended to large scale in Bangladesh. Already discussion is going on with national and regional NGOs, FFWC, Bangladesh Meteorological Department (BMD), Disaster Management Bureau (DMB), Comprehensive Disaster Management Programme (CDMP) to replicate the CFIS programme in larger areas in Bangladesh.

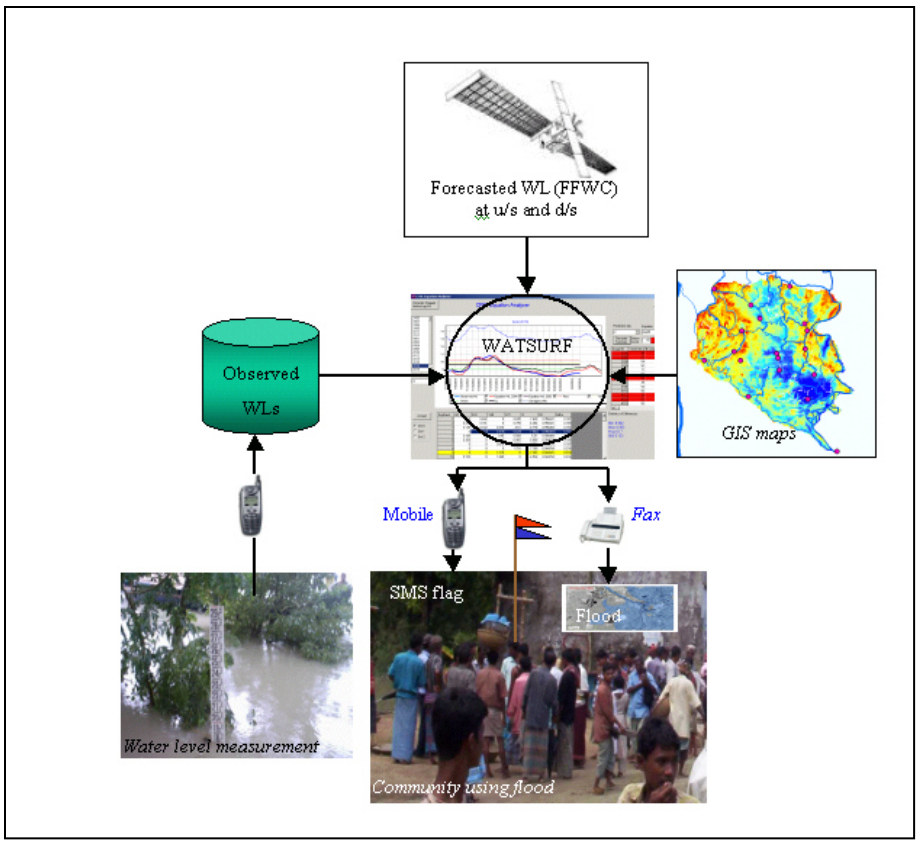


Figure 1: The Conceptual Diagram of CFIS

2.9. Name of the Initiative: Early Warning System (EWS) Study

Implementing Agency: **Flood Forecasting and Warning Centre, Bangladesh Water Development Board, Ministry of Water Resources**

Duration: May-December 2006

Funded by: Asian Development Bank

2.9.1. Description of the Programme:

Floods continue to be a major hazard in Bangladesh. Floods in 1987, 1988, 1998 and 2004 caused widespread damage in rural and urban areas and set back the country's efforts to alleviate poverty. The impacts of floods are expected to worsen as the vulnerability of Bangladesh to natural disasters is increasing due to several factors including poverty, worsening environmental soundness, population growth, urban growth, weak governance and institutional factors, and climate change and variability.

The Early Warning System (EWS) for floods in Bangladesh developed from the flood forecasting work of BWDB's Flood Forecasting and Warning Centre (FFWC), and FFWC developed a comprehensive system of collecting and processing hydrologic and other data as input to forecasting models; preparing flood forecasts and warnings on a daily basis during the flood season and disseminating the forecasts and warnings to a range of government and non-government organizations, media groups and other interested parties.

Dissemination of flood warnings is much less developed, and works only at national level. There are considerable weaknesses in making warning massages effective in enabling people and institutions to take protective action to reduce the negative impact of floods. Dissemination from the forecast organization to warning organizations for meaningful action represents the weakest link in the flood early warning system. The response element of the Flood EWS is neglected.

The existing Early Warning System for Floods has many key components in place, but adjustments and strengthening are required for the system to achieve its potential and make a significant contribution to flood preparedness and flood damage mitigation. The Programme to Enhance the Flood Early Warning System was developed to address the gaps and shortcomings of the existing EWS.

A team of experts was recruited under the project "To provide analytical input and prepare project portfolios and re-feasibility studies to enhance existing early warning system including the flood forecasting system operated by the Flood Forecasting and Warning Centre (FFWC) under Bangladesh Water Development Board (BWDB)"

Key issues addressed by the Study include (i) improving reliability of existing forecasting system, (ii) improving accuracy of weather predictions, (iii) providing longer forecasting periods, (iv) cost effective options to update the 40-year old topographic and elevation data, (v) linking of the existing flood forecasting system to major infrastructure and agriculture land to improve its usefulness, (vi) using flood forecasting information for round the year ECD/FCDI project management, and (vii) capacity and Institutional assessment of FFWC for long term sustainability (ADB-2005a).

The Study Team reviewed reports and studies related to the flood Early Warning System in Bangladesh and overseas, including reports and studies from current and proposed projects supporting the development of the flood EWS, flood damage assessment methods and international experience of flood EWS. During the Inception Phase, the Study Team consulted with BWDB and FFWC as key stakeholders in the EWS. Institutional review was also made for BMD, SPARSSO and IWFM (BUET) on their present capacity and the future programme in the improved flood forecasting. The Inception Report was prepared in June 2006 and discussed in a workshop attended by the major stakeholders and later at the Steering Committee meeting in August (ADB 2006b). Following the Inception Phase, further meetings were held with stakeholders such as DMB, BMD and CDMP to discuss their views of the current flood EWS and how the EWS could be improved. Three Case Studies were also undertaken to determine the need and potential for flood EWS in three different flood environments. The damages caused by two recent major floods were also assessed in each case study area.

During the review and consultation process, possible interventions to improve the flood EWS were identified and analysed. Further consultations on the scope for different interventions were made at the National Stakeholder Workshop held on 4th September 2006. The initial findings and recommendations of the Study Team were presented in their Interim Report (ADB 2006c).

The Study identified 22 Interventions to fit within four types of activities. Interventions for Activity A (Increase accuracy and timeliness of input data for forecasting) range from installing 23 automatic hydrologic data recording and transmission stations in boundary stations (Intervention A1) to upgrading BWDB's existing manual collection system (InterventiionA2) and improving hydrologic data exchange with upstream countries (InterventionA3). Interventions for Activity B (Improve flood forecasts to meet demands of end-users) range from improving coverage and lead-time of flood forecasts (Interventions B1, B2 and B3) and warnings to developing forecasts for infrastructure, urban, coastal and flash flood areas (Interventions B4, B5, B6 and B7). Interventions under Activity C (Improve the extent of coverage and the penetration of the early warning system) range from strengthening the network involved in the Flood EWS (Intervention C1) to developing information packages on flood warnings for different end-users (Intervention C2), dissemination of flood warning packages to end-users (Intervention C3) and ensuring flood warnings are people-centred. Interventions under Activity D (Expand coordination between key institutions in early warning system) including improving BWDB Hydrology Services (D1) and BWDB use of flood

warnings (D2), strengthening the key institutions involved in the flood EWS, enhancing national, regional and international awareness of flood forecasting (D4), Develop process to make flood forecasts and warnings useful to infrastructure managers (D5) and establishing mechanisms for monitoring, evaluation and feedback of flood EWS.

The Programme is for 5 years with the duration of interventions ranging from 2 to 5 years. The total estimated cost of 20 interventions is (excluding cost for DEM and Dopplar Radar as the financing of these are already secured) would be about Tk 2479.98 million (US$ 49.23 million).

Each element of the Early Warning Systems needs to perform effectively for flood warnings to provide benefits, and no single intervention will improve the overall functioning of the EWS by itself. Conversely, it is not possible to identify direct benefits from any single intervention, as each intervention is reliant on the performance of other EWS activities to produce benefits. The interventions are inter-dependent on each other to enhance the performance of the Flood EWS and produce benefits.

The Pre-feasibility Study was constrained by the absence of reliable data on flood damages in different sectors. The available data were often contradictory. The approach followed was to make a Pre-feasibility Study using partial benefits in sectors where some data were available. The interventions were grouped into packages, based on their impact on three key target areas for the EWS: communities, agriculture and infrastructure. Nine interventions were common to all of the three packages, and were used for the Pre-feasibility Study of the partial Programme. Costs of the 9 interventions were identified in detail and make up about 72% of the costs of the full Programme.

Pre-Feasibility Package			
A1 Upgrading collection and transmission of rainfall and water level data	B1 Expanding flood forecasting to cover all flood prone areas	C1 Establishing network of key stakeholders for disseminating flood forecasts	D1 Institutional study for the BWDB's Hydrologic Services
A2 Enhancing BWDB's manual data collection system	B3 Extending lead times of forecasts		D3 Strengthening key EWS institutions
	B7 Developing and implementing forecasting tools for flash floods		D6 Establishing monitoring, evaluation and feedback

With the combined benefits from the three target areas, the economic IRR was 64%, the B/C Ratio 9.6 and the NPV is Tk. 19,041, indicating that the investment

in the Programme to Enhance the Flood EWS is sound. The full Programme of 20 interventions would provide additional benefits in other sectors, including health.

Enhancing flood early warning systems to protect and enhance livelihoods and other mitigation interventions are cost-effetive ways of flood risk reduction

The Programme for the Enhancement of the Flood EWS will increase transparency in the Flood EWS, and support good governance by making organizations involved in flood-plain activities more responsible for their actions.

The Study Team recommends that ADB should proceed with processing the funding for the Programme to Enhance the Flood Early Warning System.

2.10. Name of the Initiative: LDRRF to fund Small Scale Initiatives to Strengthen Community Safety

Implementing Agency: **CDMP of MoFDM**

2.10.1. Description

In order to build the technical and institutional capacity of the most vulnerable to resist and cope with disaster threat, increase resilience and promote sustainable livelihoods, the Local Disaster Risk Reduction Fund (LDRRF) has been designed to support small scale innovative and strategic interventions that attempts to foster policy development and capacity building at grassroots level. The LDRRF is a funding mechanism for local demonstration projects in high-risk zones, research, dissemination, advocacy and capacity building programmes.

To reduce the devastating impacts of natural and human induced hazards the LDRRF provides access to micro capital grants for pilot projects with innovative ideas to empower the local communities. LDRRF is designed to support the programme to forge strategic partnerships with entities and ensure that all risks to a greater range of hazards at local levels are addressed and the vulnerabilities of the poor to those risks are reduced resulting in increased resilience and creating of a more sustainable livelihood options.

***Objective**:*

To strengthen capacities of the vulnerable communities by providing funds for undertaking community risk reduction initiatives.

2.10.2. Results and achievements made, with indicators if available

Under the LDRRF a call for proposals was made and 264 proposals were received under the following 3 thematic areas:

- Strengthening resource mobilization capacity
- Mobilizing disadvantaged group to safety during major threat situation (for example- cyclone , Flood, Riverbank erosion, earthquake)
- Shelter for all needs and resistant to all types of hazards

Letters of Agreement were signed with 39 entities who are implementing

a) Research and Action Research on the following (Table 1):

- Development of an effective community based early warning dissemination systems.
- Development of a disaster preparedness programme for earthquake and Tsunami hazards in costal areas especially at Cox's bazaar.
- Promoting livelihood security, Gender Equity and the needs of the socially disadvantaged groups in coping with the effect of disaster in haor areas

b) Undertake small scale innovative and strategic interventions at community level contributing towards community risk reduction efforts identified in the DRRAPs developed through CRA (Table 2)

2.10.3. Major challenges and lessons in implementing the initiative or programme, and next steps planned.

Challenges

- Involvement of Union DMCs with LDRRAF interventions.
- Changes in mindset from relief to risk reduction.
- Implement interventions through formation of Project Implementation Committee with involving community people (CRA participants) and DMCs.

Lessons learned

- Immediate implementation of options against risk reduction action plans (RRAPs) developed confidence among Union DMCs and community people.
- Reflection of community empowerment felt among vulnerable people being involved in the CRA and RRAP development process of the union.
- Coordination and relationship increased between NGOs, Union DMC and GoB through CRA exercise.
- Level of knowledge of the NGO staff and community people enhanced through participation in the CRA process
- Changes of mindset from relief and rehabilitation to risk reduction observed among GoB and community people.
- The CRA and RRAP process proved that community people can make a plan in a participatory way on their own problem.
- Developed leadership capacity among the community platform, Union DMC members, grassroots female, persons with disability etc.

2.10.4. Future Strategies:

1. Immediate implementation of options against RRAP to reduce community risks involving local Disaster Management Committees
2. Encourage DMCs to submit project proposals against RRAP for LDRRF funding
3. Gradually review performances of partner organizations for future engagement in the RRAP implementation process

Table 1. LDRRF Partners involved in Research & Action Research Projects

SL #	Partner Entities	Working areas	Project Initiative	Activities	Key result or outcome
1.	Centre for Natural Resource Studies (CNRS)	Tahirpur Upazila under Sunamgonj district	Promoting Livelihood security, Gender Equity and the Needs o the Socially Disadvantaged Groups in copping with the effect of Disaster in Tahirpur U/Z of Sunamgonj	▪ identification of all hazards ▪ Assessment of the discrimination to the socially disadvantaged people during the relief and rescue operation. ▪ Exploring the support received from the NGO, CBO, UP and other agencies. ▪ Creating necessary environment and facilities in the school and other building which can be used for hazard shelter. ▪ Identification of crisis faced by the vulnerable households during natural calamities. ▪ Motivating activities for the protection against wave erosion and disaster proof houses.	▪ Removing discrimination against the socially disadvantaged groups by prioritizing their opportunity for rescue & relief operation. ▪ Reducing the livelihood threats by the natural calamities. ▪ Capturing the outcome of the intervention and dissemination.
2.	URP-Khulna University	Ashasuni Upazila under Satkhira	Developing an Effective Community Based All Hazards Early Warning Dissemination System (EWDS) Considering Local Community's Disaster Vulnerability	▪ Baseline survey and data collection. ▪ Participatory survey and mapping. ▪ Data digitization and Automation. ▪ Analysis and system development. ▪ Early warning Dissemination System Assessment. ▪ Stakeholder analysis. ▪ Advocacy and Capacity building. ▪ Training and strengthening the local DMCs. ▪ Documentation of the Project	▪ Disaster risk maps will be produced for understanding of the magnitude and spatial distribution of disaster events. ▪ Disaster vulnerability and risk indices will be developed. ▪ Clearly understandable disaster warning messages will be developed. ▪ Capacity of dissemination disaster warning by DMC will be built ▪ Capacity building of local volunteers/change agents for effective dissemination. ▪ EW gathering and dissemination

				Result ▪ Off line and Online Publication.	network will be established.
3.	Dept. Of Civil Eng. Bangladesh University of Engineering Technology (BUET),	All Upazila under Cox's Bazar district	Development of a Disaster Preparedness Programme for Earthquake and Tsunami Hazards in Cox's Bazar	▪ Assessment of likelihood and severity of potential earthquakes and tsunamis 9including Cyclone) in the Cox's Bazar ▪ Vulnerability assessment of existing infrastructures in the area such as public and private building, cyclone shelters etc. to those natural disasters. ▪ Evaluation of effectiveness of the existing early warning dissemination system for all other natural disasters. ▪ Development of alternative Early Warning Dissemination System. ▪ Evaluation of the Early Warning Dissemination Systems. ▪ Community Awareness Programme among community leaders and community people, local NGOs, school teachers etc.	▪ Microzonation maps for earthquake and cyclones and inundation map for tsunami will be developed ▪ Potential infrastructure system will be proposed for sheltering. ▪ Effective early warning system will be developed. ▪ Awareness among the community will be developed and how to respond effectively with the early warning system.
4.	Center for Environmental and Geographic Information Services (CEGIS)	Lalmonirhat District	Development of Community Based All Hazards Early Warning and Dissemination Systems	▪ Problem analysis ▪ Procedure development ▪ Piloting ▪ Dissemination, Advocacy and sustainability ▪	▪ Introduction of community based all hazard specific Early Warning Dissemination System (EWDS) ▪ Development capacity of the activation of the EWDS of the local DMCs and other associated institutions. ▪ Developed capacity for sustainable continuation of the community based EWDS. ▪ Advocacy and dissemination for all hazards EWDS were roles of responsibilities of the all parties will be clearly outlined and will

					create an interface for follow up sustainability of the EWDS. ▪ Establish an all hazard spatial identification procedure (e.g. all hazard mapping system)

Table 2. Risk Reduction Strategies Being Implemented by CDMP 3c Partners

Risk Reduction Strategy/ Option	Additional Features	Additional Features	Benefits	Partners	Implementing Areas (Geographical Locations)
Development of Risk Protection measures through Plantation/forestation					
Development of wind breaking plantation in coastal belt (sadar union of Coxs Bazar)	Awareness, training on ALO	Technical support from forest dept. and ownership of UDMC	Reduce the life risks, support for alternative livelihood based on bamboo and cane plants	CODEC	Pokkhali Union, Sadar, Cox's Bazar
wind breaking plantation in costal areas	Awareness, training on ALO	Technical support from forest dept. and ownership of UDMC	Embankment protection from river erosion. At least 2750 family save their houses from cyclone wave.	Shushilan	Kashimari union of Symnagar Upazila under Satkhira district
Embankment protected plantation	Awareness, training on ALO	Technical support from forest dept. and ownership of UDMC	12,000 family will be benefited from river bank erosion and flood severety	SDS	Algi union of Bhanga Upazila under Faridpur district.
Development of emergency evacuation route from risk areas to emergency shelter					
Maintenance of evacuation route for the vulnerable community	To mak ethe route accessible for person with physical and visual disabilities	Plantation in both side of the evacuation route and awareness raising among the people on uses of this route during emergencies	Reduce crop risks of around 23,101 population from flood hazard and increase livelihood security of vulnerable community as well as reduce the risk of temporary shelter of livestock and emergency communication during water logging.	SAMADHAN	Diara union of Kalaroa Upazila under Satkhira district
Maintenance of Embankment			risk of damage of 400 acres crop land from seasonal flood and 400 families household asset are reduced	RDRS	Rajapur Union under Sadar Upazila of Lalmonirhat district.

Risk Reduction Strategy / Option	Additional Features	Additional Features	Benefits	Partners	Implementing Areas (Geographical Locations)
Advocacy for construction of connecting road	Awareness Raising on Uses of the route	Plantation in the both side and grassing on the top and slopes of the route for better protection and environment	Reduce the life and livelihood risk of 5000 household due to floods and river bank erosion	SAMATA	Diara Narikelbaria, Akuterchar, Dewkhali union of Sadarpur Upazila under Faridpur district
Raising risk awareness among larger community and most vulnerable people					
Raising awareness on specific risks and reduction options (identified in CRA) through pot song, courtyard meeting, poster display			At least 7,000 community people will be aware on hazard risk and save life and asset.	Shushilan	Kashimari union under Symnagar Upazila of Shatkhira district
Raising awareness through providing training (7 union)		6580 community people from different category including Female, Disable will received awareness training on risk reduction issues.	Reduce the knowledge vulnerability of 6580 community people (including Female and person with disability), on their risk environment and possible management strategies.	SDS	Kawlebera, Agli, tuzerpur, Hamirdhi, Chumordhi, Chandra, Gharua of Bhanga Upazila under Faridpur
Raising awareness on Early warning and Preparedness through providing training at 3 union		4320 community people from different category including Female, Disable, landless will received awareness training on risk reduction issues.	Reduce the knowledge vulnerability of 4320 community people (including Female and person with disability), on their risk environment and possible management strategies.	NDP	Nischintapur, Shunamukhi and Natuarpara union of kazipur Upazila under Sirajgonj district

Risk Reduction Strategy/ Option	Additional Features	Additional Features	Benefits	Partners	Implementing Areas (Geographical Locations)
Building community volunteerism for early warning					
Dissemination of Flood warning at community level	Established an early warning dissemination strategy	Establish linkage with UzDMC, District administration, BWDB, FFWC and Community volunteer.	Vulnerable community of Chowhali Upazila	BDPC	Chowhali Upazila of Sirajgonj district
Capacity building of 36 community volunteers through training on Rescue and First Aid to reduce disaster risk.			Community people specially Female, person with Disablility of Bhaga upazila under Rajshahi district	SGS	All union of Bhaga Upazila under Rajshahi district
Development of Alternative Livelihood Options (ALO) and Hazard Resilient Livelihoods					
Rain water harvesting	Maintenance Committee and Training	Environmnent friendly materials use	491 community people will take safe drinking water and reduces water born disease	Shushilan	19 village of Koikali union under Symnagar Upazila of Shatkhira
Support through alternative options for livelihood (2 nos)	Training on ALO		Income vulnerabilities of 20 Disable and Female headed family from floods and riverbank erosion will reduce	MMS	Gala and Habibullah nagar union of Shajadpur Upazila under Sirajgonj district
Raising 30 sapling nursery hazard resilient	Training on Sapling Technique	30 nursary holders will produce quality sapling	Risk of sapling unavailability after the disaster situation will reduce and the sapling nursery will be a good demonstration for the community learning	IED	

Risk Reduction Strategy/ Option	Additional Features	Additional Features	Benefits	Partners	Implementing Areas (Geographical Locations)
Reduce livelihood risks from disaster of indigenous community	increase income from livestokes and small enterprise	increase sanitation facilities	Reduce vulnerability of 35 indigenious family from disaster hazards through raising homestate, installation of latrine and grant support of livelihood	SGS	Bausha union of Bhaga Upazila under Rajshahi District.
Introducing and piloting of early and short duration rice variety					
Result demonstration plot on early & short duration variety at Haor areas	2 demo plots in each union		feasible adaptation strategy for reducing risk of crop loss by early flash floods	IED	
Farmers training on Short duration variety			increase knowledge of Farmers on Short duration variety	CNRS	union of Tahirpur Upazila under Sunamgonj district
Farmers training on Flood Tolerant variety			increase knowledge of 3220 Farmers on Flood Tolerant variety	NDP	Nishchintapur and Natuarpara union of kazipur Upazila under Sirajgonj district
Raise the plinth of houses/common places/school fields/ other community resource places above/free/resilient from/to Hazards					
Raising plinth of homestead at Sunamgonj			around 125 population from 25 Family will save their life, household asset from Flood	IDEA	Behali union of Jamalgonj Upazila under Sunamgonj district
Raising ground of common place at Haor areas using as harvesting place.			approximately 11 villagers will use the place for harvest their crops safely during the time of flash flood	IDEA	Behali union of Jamalgonj Upazila under Sunamgonj district
Raising Homestead ground above flood level			Reduce damage of livelihood and household asset a	IRB	Patharia union of Sadar and Asherkandi union of Jagannathpur

Risk Reduction Strategy/ Option	Additional Features	Additional Features	Benefits	Partners	Implementing Areas (Geographical Locations)
					Upazila under Sunamgonj district
Raising plinth for Flood free house			Reduce the risks of 32 vulnerable family from flood	SAMADHAN	Diara union of Kalaroa Upazila under Satkhira district
Raising plinth for school ground for using as temporary shelter			Reduce Risks of community people specially Disable and Female and school students through raining school ground	SAMADHAN	Joynagar union of Kalaroa Upazila under Satkhira district
Raising plinth of homestead at Lalmonirhat			108 disable, women headed and landless will save their life, household asset from Flood	RDRS	Khuniagach union of Sadar and Mohishkhocha union of Adimari Upazila under Lalmonirhat district
Killa construction (4 nos)			Reduce risks of community people through saving their life and household asset.	SAMATA	Charmonair, Diara Narikelbaria, Char Bishnopur and Akuterchar union of Sadarpur Upazila under Faridpur district
Raising plinth of homestead at Sajadpur, Sirajgonj (2)			Reduce risks of 40 disable and women headed will save their life, household asset from Flood	MMS	Gala and Habibullah Nagar union of Shajadpur Upazila under Sirajgonj district

Risk Reduction Strategy/ Option	Additional Features	Additional Features	Benefits	Partners	Implementing Areas (Geographical Locations)
Killa construction at Char areas for temporary shelter (2)			At least 405 Family can save their life and household asset.	NDP	Shuvagacha and Natuarpara union of kazipur Upazila under Sirajgonj district
Raising school ground cum Flood shelter			Reduce risks of community people through saving their life and household asset and 250 school going student will be benefited.	NDP	Char Girish union of kazipur Upazila under Sirajgonj district
Maintenance of Killa				RIC	Uzantia union of Pekua Upazila under Cox's Bazar district

Risk Reduction Strategy/ Option	Additional Features	Additional Features	Benefits	Partners	Implementing Areas (Geographical Locations)
Protection of cropland and living places from hazards by small structural intervention and strengthening the existing structures					
Construction and Maintenance of Jungle (8 nos.) to protect crops from flash floods	Pre and Post intervention comparative analysis (photographs, documentation, video, interviews, news articles and crop survey)		47000 acres crop land and 92000 peoples livelihood means (crops) save from early flash floods	IED	Sukbari Rajapur, Pikurhati, Madanagar, Chamerdani, Selboras and Bangshikunda Union of Dharmapasha Upazila
Protection of High Risk Villages Mounds (3) from haor wave using Chilla at Haor areas.	Awareness raising on risk and this measures after assessing its success	Training to Highly Poor People on Alternative Livelihood Options based on Chilla	Reduce the risk of village erosion due to flash flood caused haor wave.	CNRS	union of Tahirpur Upazila under Sunamgonj district
Re-excavate water way for drain out surplus water					
Re-excavation of canal			Reduce the risks of share croppers, small and marginal farmer, owner of fish pond.	SAMADHAN	Jalalabad union of Kalaroa Upazila under Satkhira district

2.11. Name of the Initiative**:** Tsunami Risk Management - The MoFDM Initiative

2.11.1. Description:

Bangladesh has narrowly escaped from the 2004 Asia Tsunami. This escape was for the following reasons, so far identified by the scientists of Bangladesh:

The 720 km long coastal front of the country was hit by tsunami after 3 hours of the Earthquake with only 25-30 cm of wave height, because of-

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

2.11.2. Results and achievements

In response to Asia Tsunami, Ministry of Food and Disaster Management (MoFDM) arranged an inter-ministerial meeting on disaster preparedness followed by a series of workshops and meetings contributing to the development of a draft plan of action for tsunami risk reduction in Bangladesh.

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, and government policy and emergency management procedures. Existing Cyclone Preparedness Programme (CPP) should be strengthened in a way that they can prepare the community for tsunami as well as cyclone.
- Development of Rescue, Relief and Rehabilitation Plan of Action based on Comprehensive Risk Assessment.

The major areas of Bangladesh Government's Plan of Action for Tsunami Reduction are follows:

- Establish an effective early warning system
- 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.
- Integrate tsunami issues into Coastal Zone Management Policies and Plans
- Undertake mass awareness programme

- Develop and implement mitigation strategies
- Develop a contingency plan for rescue, relief and rehabilitation plan for tsunami and cyclone disaster
- Integration of disaster management into national development policy
- Generation and dissemination of information on disaster management
- Capacity Building of the Cyclone Preparedness Programme(CPP) to include Tsunami

2.11.3. Tsunami Preparedness

In order to reduce the tsunami vulnerability in the coastal districts of Bangladesh followings are planned under CDMP of MoFDM to undertake with the financial assistance from the European Commission.

The activities include:

1. Updating available information on cyclone shelter management for tsunami preparedness: An impotent aspects of this issue is to find out if the shelters constructed for cyclone are appropriate for tsunamis. Since theses shelters were originally built for cyclones, there is a need to understand how they would perform under the impact of tsunami. Therefore, the appropriateness of the shelters for the purpose of tsunami is an aspect of the management system that should be studied. There is simultaneously a need to understand how many villages will be served by the existing shelters.

2. Use existing data on available digital elevation models to prepare useable tsunami inundation risk maps for the entire coastal region. This activity will generate a picture of the risks faced by the population in this area, so that there can be risk mitigation activities. Identifying the risks the population faces at the time of the event is important if we want to take action ahead of time to reduce the vulnerability of the population.

3. Identify tsunami vulnerable school/hospital/emergency response and asses buildings in the coastal area and evaluate adoption capacity to tsunami events: Buildings that house critical services and infrastructures need to be identified to assess their vulnerability to tsunamis. Vulnerable structures, including schools, hospitals. District head quarters, fire services, CPP offices, Red Crescent offices and other emergency response buildings can than be targeted for vulnerability reduction, leading to raising awareness among the infrastructure maintainers.

4. Identify and appraise economic risk exposure of coastal livelihoods (e.g. fishing/tourism) to tsunami: This activity should analyze the risk posed to coastal livelihoods and build on the community risk assessment that is already taking place in CDMP.

The following requires development assistance:

- Establishing real time seismic and sea level network in Bangladesh

- Upgrade the present non IP link to Tokyo through New Delhi to direct IP link to Tokyo (Japan Meteorological Department)

- Establish direct communication link through V-SAT with Pacific Ocean Tsunami Warning Center at Hawaii

- Establish direct communication link to the future Indian Ocean Tsunami Warning System

- Needs assistance in obtaining real time Oceansat and Radarsat data as well as software to analyze data and real time ground stations

- Needs involvement in ICG/IOTWS, through the Working Groups of IOTWS

- A thorough tsunami vulnerability study be undertaken that takes into consideration both distant and locally generated tsunamis

HFA Priority for Action 3:
Use knowledge, innovation and education to build a culture of safety and resilience at all levels
The Bangladesh Initiatives

This section of the report describes the following Bangladesh initiatives have been undertaken since the WCDR relating to partnership building, information management and exchange, education and training, research, and public awareness:

3.1. Building public-private partnership for reducing the underlying risks: The CDMP Approach

3.2. Campaign for Disaster Risk Reduction Education -The CDMP Advocacy Initiative

3.3. Capacity Building of Disaster Management Committees – The DMB Initiative

3.4. Synopsis of the Adaptation Research Projects of the Climate Change Cell, Department of Environment through CDMP

3.1. Name of Initiative**:** Building public-private partnership for reducing the underlying risks: The CDMP Approach

3.1.1. Description, objectives and activities

The Ministry of Food and Disaster Management (MoFDM) is mandated for coordination of disaster management activities in Bangladesh. It has the mandate for coordinating disaster management and utilizes the corporate and strategic planning processes as the key management tools for implementation and monitoring of strategies. Uniformity in methodology and procedure (i.e. training design and standards) across all agencies is a major goal of the MoFDM. Implementation of disaster management programmes is undertaken through a network of collaborative partnerships.

In the last two years much of the emphasis was given to establish a holistic partnership framework to integrate the Programs, Priorities and Resources of Government, NGO's and Private Sector in one consolidated Risk Reduction Program. The framework and key attributes are presented below:

3.1.2. Results and achievements

Followings are the key specific achievements of the year:

Building Strategic Partnerships

- Established disaster management and climate change focal points within the relevant departments of all line ministries for integration of DRR strategies into sectoral plans and programmes
- Signed MOUs with ADPC, Concern Worldwide in Bangladesh, Bangladesh Meteorological Department under the Ministry of Defence, World Food Programme, Bangladesh and Cyclone Preparedness Programme
- Working on finalization of MOUs with WFP in Bangladesh, FFWC, BRDB, CEGIS, BUP, IWM, BEEN, Action-Aid

Building Scientific partnership

- Published institutional roadmap for climate risk modeling
- Conducting institutional mapping for earthquake and tsunami vulnerability analysis and mapping
- Processing MOUs with FFWC, IWM, CEGIS, BUP, BUET, BBS, BRDB for necessary data and information and technical supports

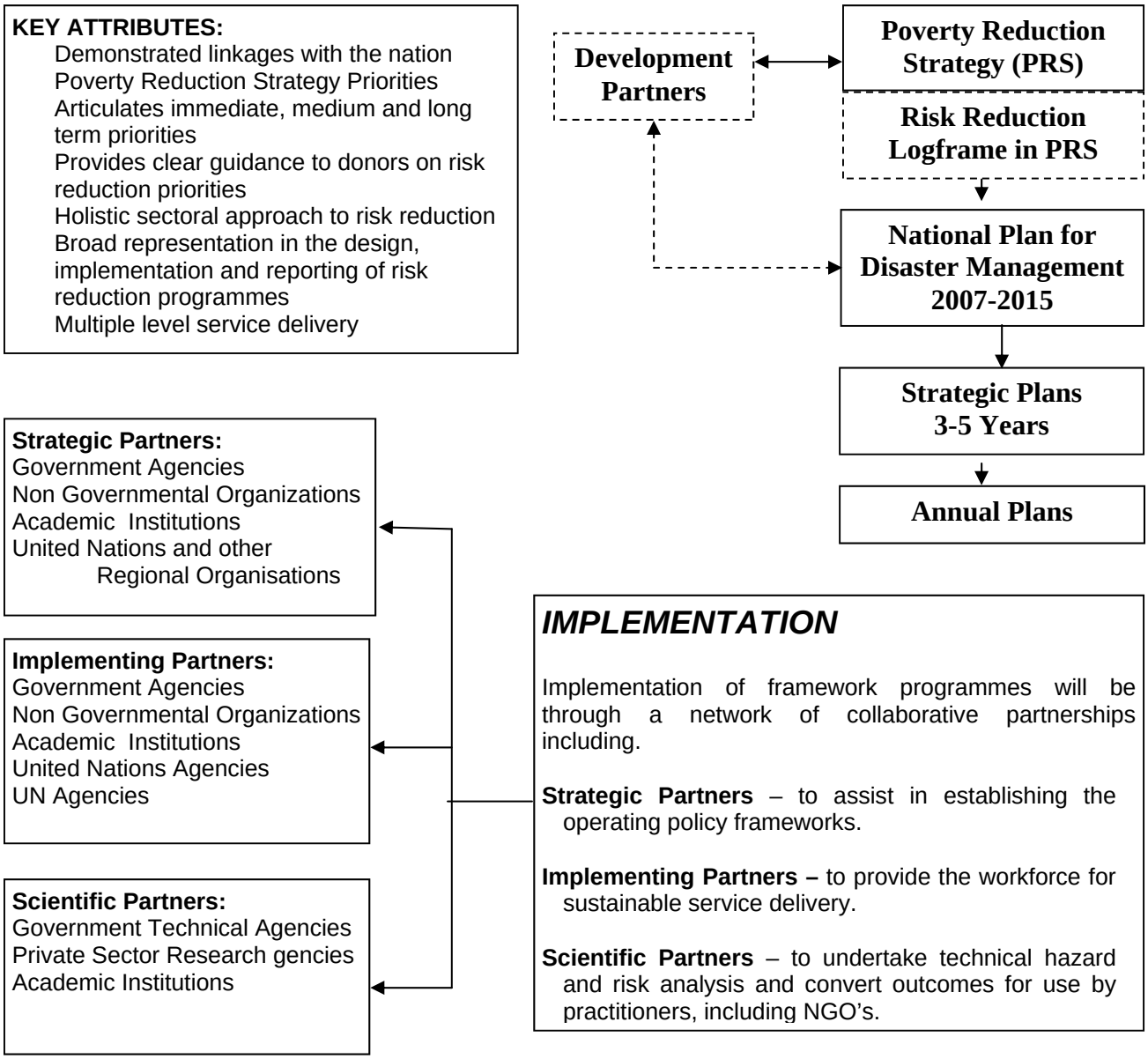
Building Implementation Partnerships

- Signed LOAs (Letter of Agreements) with 11 entities to implement capacity building training programme for Disaster Management Committees (DMCs) at lower administrative levels
- Signed LoAs with 12 entities to facilitate Community Risk Assessment

process and develop union (lower) level risk reduction action plans through consultation with key community vulnerable groups and DMC members

- Signed LOAs with 39 entities to implement the small scale risk reduction projects at the community level
- Signed LoAs with 7 entities to conduct climate change adaptation research on a number of priority issues

THE CDMP PARTNERSHIP FRAMEWORK



3.1.3. Major Challenges and lessons in implementing the initiative and next steps planned

- Although CDMP's contribution in achieving the policy and planning reforms for long term risk reduction was significant, more efforts would be required for necessary government buy-in.

- Formalizing partnerships through signing of Letter of Agreements takes a substantial amount of time which delayed the field level delivery. Major challenge is maintaining of standards in service delivery by partners with differing implementation capacity.

- CDMP is pursuing an integrated approach for disaster management with an all hazard, all risk and all sector focus. This is a new approach and CDMP made a considerable effort to build the partners capacity which delayed the overall field service delivery. A further effort would be required to change their mindset as well as build their capacity in terms of qualitative service delivery against the targeted outputs and outcomes.

- Promoting CDMP Partnership framework among donors in order to ensure complementarity and avoiding duplication and repetition of efforts.

3.2. Name of initiative and programmes **:** Campaign for Disaster Risk Reduction Education -The CDMP Advocacy Initiative.

3.2.1. Description:

This initiative has been undertaken by the Advocacy Component of CDMP implemented by the Disaster Management Bureau, Ministry of Food and Disaster Management. The Programme is designed towards changing the mind set of the key policy players to achieve the paradigm shift in disaster management from the traditional relief and response to a more comprehensive risk reduction culture, the latter is the Mission of the Ministry of Food and Disaster Management and the mandate of CDMP. In order to achieve this, the role of media is found very vital to sensitize the policy planners, implementing agencies and other stakeholders and therefore the following objectives are set:

Objectives:

- Promoting the role of electronic media to focus more on risk reduction issues.
- Facilitate capacity building of the journalist in risk reduction reporting
- Raising public awareness for adopting risk reduction culture
- Increase the institutional capacity of academic and training institutes to incorporate risk reduction in their own business plan.

Followings are the key activities undertaken in 2005-2006

- Produced 3 documentaries on disaster risk management
- Conducted training for the journalists on risk reduction reporting
- Introduced Media Award for the journalists of print and electronic media based on the best report and programs focusing risk reduction initiatives. In 2006 awarded 4 awards for best Media and essay competitions
- Included risk reduction issues in National Television Debate Competition with Bangladesh Television.
- Organized special talk-show with private TV channels
- Developed advocacy materials and information kits for sensitizing the concern persons
- Observed the international and national days for disaster reduction
- Published souvenir and supplement in national dailies.
- Conducted researches on climate risk adaptation strategies and local coping mechanisms
- Established Disaster Management and Climate Change Focal Points within the relevant ministries and its departments
- Developed curriculum of Disaster Risk Management for University of Dhaka
- Facilitated the introduction of diploma course on disaster risk reduction with BRAC University
- Conducting the training courses on disaster management in National Training Institutes, where two hours session on disaster management is compulsory

3.2.2. Results and achievement made with indicators

- The media in Bangladesh is playing active role in promoting risk reduction
- Disaster Risk Reduction as a development agenda has been incorporated in the PRSP.
- In 2006 the Bangladesh National Parliament passed the Bill Dhaka City Construction Act -2006 which took the shape of legal framework of Building Code.
- The Ministry of Primary and Mass Education and the Ministry of Agriculture has taken institutional measures to incorporate disaster risk reduction in their organizational policies and plans.
- The University of Dhaka, Bangladesh University of Engineering and Technology (BUET), Jahangirnagr University has included risk reduction issues in their disaster management academic curriculum. The private universities are also convinced and showing interest to introduce post graduation course in disaster management.
- Ministry of Environment, Ministry of Agriculture and the Ministry of Food and Disaster Management are implementing projects and programs to address climate change impacts in Bangladesh
- GO-NGO partnership has been strengthened through implementation of Risk Reduction Projects including Local Risk Reduction Plans both under government and CDMP initiatives.

Major Challenges

- Institutional arrangements for mainstreaming disaster risk reduction across sectors and government mechanism requires is a time consuming and lengthy procedures
- Lack of mechanism for establishing institutional accountability in addressing disaster risk reduction
- Enactment of Disaster Management Act is taking time due to the absence of parliament and elected government

3.2.4. Next Steps

Advocacy for Mainstreaming Risk Reduction within National Planning Processes will be strengthened and expanded with different ministries, departments and agencies.

3.3. Name of the initiatives and programme: Capacity Building of Disaster Management Committees – The DMB Initiative

3.3.1. Description

In August 1999 the Ministry had issued the Standing Orders on Disasters (SOD) to guide and monitor disaster management activities in Bangladesh. Under the SOD a series of inter-related institutions, both at national and sub-national levels have been created to ensure effective planning and coordination of disaster management and emergency response events.

Diagram: National Disaster Management Institutions

The component 2b of CDMP implemented by the Disaster Management Bureau is designed to strengthen the institutional capacity of Disaster Management Committees to ensure that the committees are playing a more proactive role in guiding the implementation of risk management activities and thereby contribute to achieve the CDMP's ultimate goal to strengthen the capacity of the Bangladesh disaster management system to reduce unacceptable risks and improve response and recovery activities.

Following are the key activities implemented

1. Review the roles and responsibilities of DMCs to reflect risk reduction function
2. Undertake a Training Needs Assessment and develop training curriculum
3. Implement training programme through outsourcing
4. Establish and operationalize monitoring and evaluation systems

3.3.2. Results and achievements made

- Revised the roles and responsibilities of DMCs at all levels incorporating their risk reduction functions through consultation with the DMC members at all levels
- Undertook a training need assessment (TNA) and developed the training curriculum based on the TNA findings
- Made a partnership arrangement with 11 NGOs to implement the capacity building training programme for DMCs in 7 CDMP pilot districts
- So far about 9000 members of nearly 300 DMCs received the 3-day Introductory Disaster Management (IDM) training. The DMC members are also offered skill based Community Risk Assessment (CRA) training through component 3b of CDMP.
- Established and operationalizing the capacity building monitoring and evaluation systems

3.3.3. Major Challenges and lessons in implementing the initiative or programme, and next steps planned.

***Challenges*:**

- Limited understanding of Comprehensive Disaster Management approach within the DMC members.
- Political instability affecting the implementation of training programme as per timeframe.
- Inadequate coordination mechanism to facilitate mainstreaming risk reduction.
- Inadequate human resources

3.3.4. Next Steps:

- Greater emphasis towards mainstreaming.
- Consolidation of CDMP efforts towards a more team focuses approach.
- Awareness raising among political leaders, policy makers and donors.
- Expansion of capacity building training programme.
- Integration of CRA and LDRRF with training programme.

3.4. Name of the Initiatives: Synopsis of the Adaptation Research Projects of the Climate Change Cell, Department of Environment through CDMP

3.**4.1.**	**Title of Project**	**Org.**	**Location**	**Start**	**End**	**Duration (Month)**	**Goal/Objectives**	**Key result/Outcome**
1	Climate Change, Gender and Vulnerable Groups in Bangladesh	BASTOB	Noakhali, Cox's Bazar, Satkhira, Faridpur, Dhaka, Sunamganj, NaogaFaridpur, Kurigram, Jessore	Aug'06	Jun'07	11	Build an information source on specific aspects of vulnerability of women and disadvantaged groups to climate change which would reduce vulnerability of women and disadvantaged groups under climate change.	The impacts of climate change and examples of climate change adaptation measures specific to target groups identified as well as the barriers of the implementation of adaptation measures
2	Adaptive Crop Agriculture Including Innovative Farming Practices in the Haor Basin	Centre for Natural Resources Studies (CNRS)	Sunamgonj	Aug'06	July'07	12	Equip farmers in the haor regions (through testing and demonstration) with appropriate rice varieties, other alternative crops and agricultural technologies to sustain their livelihood opportunities from adverse climate change situations.	Short duration boro rice, different appropriate technologies, more feasible cropping pattern, more profitable cash crops.

3	Crop Insurance as a Risk Management Strategy in Bangladesh	Department of Environmental Science & Management (DESM), North South University (NSU)	Barisal, Lalmonirhat, Sunamganj	Dec'06	Sep'07	10	Analyse crop insurance schemes and success/failure of such schemes in the past, in Bangladesh as well as Identify how crop insurance fits in with people's livelihoods and existing risk management strategies.	Actual demand for crop insurance in project areas identified as well as the obstacles to the introduction of crop insurance and how these obstacles could be addressed.
4	Climate Change and Health Impacts in Bangladesh	Bangladesh Centre for Advanced Studies (BCAS)	Rajshahi, Manikganj, Satkhira	Aug'06	Dec'06	5	Identify Climate Change associated health impacts in order to ascertain the degree of impact on the current health situation.	Co-relation between climate induced extreme events (weather variability, floods, drought and salinity) and the health problems of community established.
5	Adaptive Crop Agriculture Including Innovative Farming Practices in the Coastal Zone of Bangladesh	Centre for Environmental and Geographic Information Services (CEGIS)	Satkhira	Aug'06	Dec'07	17	Find out suitable adaptation measures/technology, including identification of new variety of crops as well as testing of the available crop varieties that have the potential to help farmers to sustain their livelihood opportunities in the backdrop of climate change.	Adaptive salt tolerant feasible crops and technologies under different climate change scenarios.

6	Climate change and its impact on transmission dynamics of cholera	International Centre for Diarrhoeal Disease Research, Bangladesh (ICCDR,B)	Chandpur	Aug'06	Feb'07	7	Gather data needed to develop a cholera prediction model that would monitor ocean parameters as well as climatic variables that would have an impact on the transmission dynamic of cholera.	A model that describes climate change impacts on cholera transmission in Bangladesh.

Status of Adaptation Research Program (May 2007)

Project Name	Implementing Firm	Status*
1. Climate Change, Gender and Vulnerable Groups in Bangladesh	BASTOB	▪ The literature survey has been completed ▪ PVAs (Participatory Vulnerability Assessment) have been completed. ▪ Analysis of barriers of Adaptation measures and Adaptation measures vs Sustainable development is being carried out.
2 Adaptive Crop Agriculture Including Innovative Farming Practices in the Haor Basin	Centre for Natural Resource Studies (CNRS)	▪ Participatory Land Use Survey (PLUS) has been completed ▪ Community Risk Assessment completed ▪ Selection of Site & of crop and vegetable varieties completed ▪ Farmers training completed ▪ Demonstration plot set-up completed and different variety of crops are transplanted ▪ All crops (17) have been harvested ▪ Data analysis is going on
3 Crop Insurance as a Risk Management Strategy in Bangladesh	Department of Environmental Science & Management (DESM), North South University (NSU)	▪ Analysis of micro-insurance schemes (crop insurance schemes in particular) based on literature review completed ▪ Identification of stakeholders at local, regional and national levels (including farmers, Disaster Management Committees (DMCs) completed ▪ Inception workshop held ▪ Project area Selected ▪ Field activities expected to start soon
4 Climate Change and Health Impacts in Bangladesh	Bangladesh Centre for Advanced Studies (BCAS)	▪ Project completed, final report submitted
5 Adaptive Crop Agriculture Including Innovative Farming	Centre for Environmental and Geographic Information	▪ Literature Review ▪ Community Consultation and Impact Assessment

Practices in the Coastal Zone of Bangladesh	Services (CEGIS)	completed ▪ Identification of Adaptation options completed ▪ Selection of Site & Crop completed ▪ Demonstration plot set-up completed and different variety of crops are transplanted ▪ Rice crops (*Rabi*) harvested ▪ Non-rice crops (Okra & aroid) are on field
6 Climate change and its impact on transmission dynamics of cholera	International Centre for Diarrhoeal Disease Research, Bangladesh (ICCDR,B)	▪ Project completed, final report submitted

- Status as on May 2007

Hyogo Framework Priority for action 4: Reduce the underlying risk factors

The Bangladesh Initiatives

This section of your report should cover matters such as environmental and natural resource management, social and economic development practices, land-use planning and other technical measures, as referred to in paragraph 19 of the Hyogo Framework for action

4.1. Urban Disaster Risk Reduction and Management

- 4.1.1. Formulation of the National Building Code
- 4.1.2. Earthquake and Tsunami preparedness – MoFDM Initiatives
- 4.1.3. Initiative of Educational Institute, GoB Organizations and NGOs

4.2. Crop Insurance as a Risk Management Strategy in Bangladesh

4.3. Integrated Coastal Zone Management, Bangladesh

4.4. Improved Adaptive Capacity to Climate Change for Sustainable Livelihoods in the Agricultural Sector of Bangladesh

4.1. Name of the Initiative: Urban Disaster Risk Reduction and Management

4.1.1. Description, objectives, main activities of the initiative or programme

Due to the human influx in the cities, unplanned urban growth, lacking of contingency planning, inadequate instrumental facilities for search and rescue works, the urban area of Bangladesh is getting more and more vulnerable mainly for two types of hazards like earthquake and fire.

Bangladesh is locating in a seismically active zone. In the last 150 years, Bangladesh has been experienced 7 large earthquakes with their epicentres in and around the boarder of Bangladesh. No detailed oriented works so far have been done to address the earthquake hazard and vulnerability in the country. Now-a-days, in combating the earthquake hazard the Government of Bangladesh (GoB), NGOs and educational institutes have been taken some initiatives in terms of preparedness, capacity building and awareness development.

Initiatives/Programme with Objectives, Achievement and Challenges

4.1.1. Formulation the National Building Code

4.1.1.1 Bangladesh National Building Code (1993):

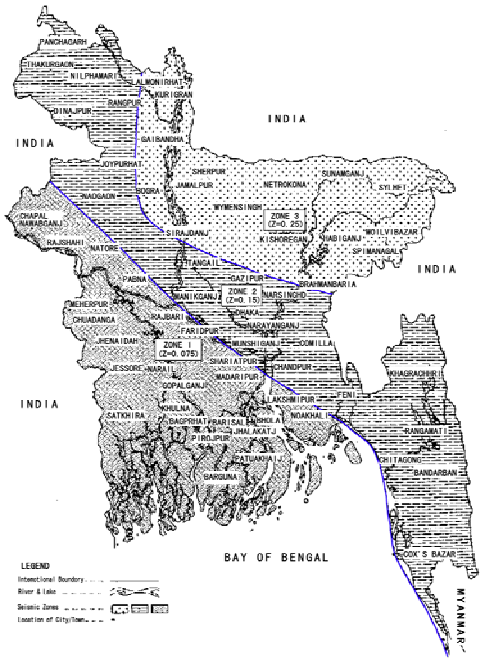


Figure 1: Seismic macrozoning map of Bangladesh

In 1977 the government commissioned a committee of experts to prepare seismic zoning map and to develop a building code. In 1992 the Government appointed another expert committee to prepare a National Building Code, which developed a new zoning map based on which Bangladesh national Building Code (BNBC, 93) is proposed. The Bangladesh National Building Code (BNBC 93) is the national guideline for the construction of earthquake-resistant buildings. The seismic zoning map of Bangladesh is given below based on which BNBC, 93 has been proposed:

It has been made mandatory to comply with any building construction under the building construction act of 1992. The code keeps provisions for earthquake and fire resistant measures in any buildings.

4.1.1.2. Objective of the building code is to establish minimum standards for design, construction, quality of materials, use and occupancy, location and maintenance of all building with in Bangladesh.

4.1.1.3. Achievement: BNBC brought under the gazette notification of Bangladesh Government in November 2006.

4.1.1.4. Major challenges: Though, Bangladesh National Building Code (BNBC 93) is the national guideline for the construction of earthquake-resistant buildings, but, adherence has been relax for many years due to lack of enforcement. So, the major challenge is to motivate the people to follow the building code during construction and to introduce retrofits in the existing building for reducing the earthquake hazard

4.1.2. Earthquake and Tsunami preparedness – MoFDM Initiatives

4.1.2.1. Earthquake preparedness for the major cities of Bangladesh and Tsunami vulnerability for the entire coastal zone

The comprehensive Disaster Management Program of Bangladesh (CDMP) has been executing an Earthquake and Tsunami preparedness component being funded from European Union (EC) and implemented by UNDP with in the jurisdiction of the Government of Bangladesh (GoB). Earthquake disaster risk has been increasing in the major cities of Bangladesh, such as, Dhaka, Chittagong and Sylhet; due to the rapid influx of population and unplanned urban infrastructural development. Beyond the storm-surge hazard, the costal zone of Bangladesh is also exposed to tsunami hazard, though December 2004 Indian Ocean tsunami didn't hit the coastal area of Bangladesh. The activities of this initiative has been started from the beginning of 2007 and scheduled to be finished by June 2009.

4.1.2.2. Objective of earthquake and tsunami preparedness initiative within the overall framework of CDMP is to facilitate the introduction of a comprehensive geo-hazard risk reduction "Contingency Planning" strategy with particular attention to hazards resulting from earthquake especially in urban areas and vulnerability to tsunami in coastal areas. The further development objective is to link with the primary objective of CDMP, which is to strengthen the capacity of the Bangladesh Disaster Management system to reduce unacceptable risks and improve response and recovery activities.

4.1.2.3. Expected output of the initiative: The component is expected to result in three main outputs:

Output 1: Contingency Planning for Non Seasonal Disaster Risks is introduced by city corporations in Dhaka, Chittagong and Sylhet.
Output 2: Earthquake vulnerability mapping is introduced into Contingency Plans for cities of Dhaka, Chittagong and Sylhet
Output 3: Tsunami vulnerability mapping is introduced into Contingency Plans for Chittagong, Coxs Bazar, Satkhira, Khulna, Bagerhat, Barguna, Patuakha, Bhola and Noakhali Districts

4.1.3. Initiative of Educational Institute, GoB Organizations and NGOs

4.1.3.1. Research work, contingency planning and awareness development

The leading educational institute of Bangladesh, like, Dhaka University (DU), Bangladesh University of Engineering and Technology (BUET), Chittagong University of Engineering and Technology (CUET), Shajalal University of Science and Technology (SUST) has been conducting research on the earthquake hazard and vulnerability assessment of Bangladesh. In conducting the research work, they are getting assistance from the GoB and foreign universities. Bangladesh Meteorological Department (BMD) and Geological Survey of Bangladesh are active in conducting activities of earthquake hazard assessment. They also provide data to research organization. The armed forces developed contingency plan in promoting search and rescue work during any sort of urban disaster. NGOs are working in disseminating awareness to city dwellers against earthquake hazard.

4.1.3.2. Objective of the initiative is to create trained manpower and develop the capacity of the institution in reducing urban seismic hazard.

4.1.3.3. Activities of the initiative: Geology Department of Dhaka University is running a project with Columbia University of US being equipped with couple of Seismogram and Differential Global Positioning System (DGPS). Whereas, BUET installed couples of accelerogram in different part of the country with the assistance of USGS. Bangladesh armed forces have developed contingency plan for Dhaka city area differenciating the cities into eight zones.

Among the government organization, BMD recently installed two borehole seismometers in Dhaka and Sylhet and updated one seismometer in Chittgaong which was installed fifty years back.

4.2. Name of the Intervention**:** Crop Insurance as a Risk Management Strategy in Bangladesh

Implementing Agency: **Climate Change Cell of Department of Environment under CDMP**

4.2.1. Description, objectives and activities

Climate change is already an established fact, with global temperature increasing steadily for the last two decades. Consequences of such climatic changes are evident in many areas of the world. Agriculture is one of the sectors likely to affected most due to extreme weather events like cyclone, flood or drought. Some other impacts of climate change like change in average temperature, precipitation pattern and timing or sea level rise and resulting inundation or salinity level - all of these factors are related to the agriculture sector affecting crop production as well. While global environmental politics appears not much in favor of mitigation measures to arrest climate change, adaptation is becoming popular as the measure to cope with such adverse impacts. Along with the structural or technical measures, adaptive measures like crop insurance – and micro insurance in general – has been discussed in the international community as a means to address risks to the poor resulting from climatic changes. For floodplain developing countries like Bangladesh, structural measures often are found less effective. So non-structural measures like micro-insurance or crop insurance are being suggested as instruments for adaptation. Bangladesh NAPA has also included it as a priority project. The rationale is that that poverty and vulnerability to climatic changes feed each other, and this nexus warrants that climate change policies work in concert with poverty reduction policies. However, traditional micro-credits and savings are inadequate when poor households with no safety or security nets are exposed to risks beyond their means to cope with. Therefore, micro/crop insurance for the poor farmers, customized to specific needs of poor households, may be an effective mechanism of adaptation to climatic change.

The existing loan or life insurance products of some of the NGOs in Bangladesh do not cover property or asset losses of communities from any kind of disasters. In hindsight, crop insurance was started in the late 1970s under FAO's support in Bangladesh, but it did not succeed as expected. On the other hand, there is great paucity of systematic data and information about agricultural production, or crop losses from disasters, particularly at micro levels. Current and potential impacts of climate variability and change add complexity to the issue.

4.2.2. Objectives of the Study

As part of the CDMP's Adaptation Research Programme under Climate Change Cell, the Department of Environmental Science & Management (DESM), North-South-University (NSU) is conducting the research project to analyse crop insurance schemes and success/failure of such schemes in the past, in Bangladesh as well as identify how crop insurance fits in with people's livelihoods and existing risk

management strategies. Considering the diversity of vulnerability contexts in relation to climate variability and change, the following district have been selected for the project. ™ Gaibanda: Monga prone area / Rajshahi: Drought-prone area ™ Patuakhali / Barisal / Satkhira: Cyclone & flood prone area ™ Sunamganj: Flash flood area.

The research will provide the following outputs

- An overview of micro-insurance schemes in Bangladesh (in general and crop insurance schemes in particular) and an analysis of success/failure of such schemes in the past.
- Stakeholders at local, regional and national levels (including farmers, Disaster Management Committees (DMCs), other local government institutions, relevant private sector entities such as banks and insurance companies, cooperative groups and associations) identified and their roles in crop insurance schemes recognized.
- Actual demand in project areas for crop insurance and how crop insurance fits in with people's livelihoods and existing risk management strategies identified.
- Potential crop insurance providers, obstacles to the introduction of crop insurance and way to address these obstacles identified.

4.2.3. Results and achievements made, with indicators if available

An overview of micro-insurance in general and crop insurance in particular in the context of Bangladesh, based on a content analysis of published articles, seminar proceedings collected from the Insurance Academy and Internet-based materials has been completed. The analysis indicates that there are basically two general models of insurance provision, with some variants, for the poor: Partner-Agent Model & Community-based insurance model. However, these models do not yet cover crop insurance.

The research team has worked on identification of stakeholders at local, regional and national levels. For the purpose, contacts have been established with the relevant Institutions/NGOs. Together, the private insurers and micro-finance organizations are being consulted. The academic departments of Economics and Development Studies are also regarded as important stakeholders in articulating the issues of crop insurance. An inception workshop was organized at NSU premise on 22 March, attended by a cross-section of participants, who represented all the major stakeholders from the Government, Private and NGO sectors. The inception workshop was mainly arranged to introduce the project to a broader range of experts and stakeholders and get their inputs and feedbacks.

3.4.1. Next Steps

The field level farmers' survey has started in the mid-May. The plan also includes discussion/interview with, public sector, private sector & MFI-NGO insurance

providers insurance provider; donor representatives (including FAO, UNDP and World Bank); policy-makers (Ministry of Agriculture, Ministry of Finance, including ERD and Planning Commission etc); national academics and international experts. The study findngs will be shared in a National consultation workshop and submitted to the CCC for further dissemination

3.5. Name of initiative and programme: Integrated Coastal Zone Management, Bangladesh

4.3.1. Description, objectives, main activities of the initiative or programme

In the late 1980s, the Economic and Social Commission for Asia and the Pacific (ESCAP) sponsored the first major initiative in the evolution of a coastal zone management policy in Bangladesh. A report titled "Coastal Environmental Management Plan for Bangladesh" was produced in 1988 (ESCAP, 1988) addressing the most obvious problems of the coastal zone with emphasis on the need for integrating socio-economic and environmental issues. This was followed by a series of studies and activities, but often these were designed and implemented in isolation. This lack of integration and coordinated efforts was recognized by the Government of Bangladesh (GoB) and reflected in a "Policy Note" on ICZM (1999).

In the same year (i.e., 1999), three development partners of Bangladesh (i.e., the World Bank, the Netherlands Government and the World Food Programme) fielded a mission to identify specific concepts, goals, objectives and policies to move forward the process of integrated management of the coastal zone. The mission elaborated an integrated and holistic approach taking into account the whole range of stakeholders and the implications of their activities and fostered an attitude of adaptation and response to the zone's special challenges. ICZM is seen as a process that will evolve gradually, founded on clear goals and a strong consensus. The mission issued a report: "Concept Note and Development Process on Integrated Coastal Zone Management" (1999).

The GoB Policy Note and the Concept Note produced by the donor mission laid the foundation for ICZM in Bangladesh and subsequently a Technical Assistance Project Proforma (TAPP) was prepared by the GoB in August 2000. This TAPP outlined the setting up of the Program Development Office (PDO).

The PDO started operating in the course of 2000, funded from remaining funds of the Meghna Estuary Study (MES) project. The Dutch Government funded an Interim Phase for the period August 2001 – January 2002 after the MES project ceased to operate on 31 July 2001. During this period, it became clear that the World Bank withdrew its involvement and that the Department for International Development (DfID) of the British Government was interested to support the process of coastal development in Bangladesh. Consequently, the project started its three-year operations from February 01, 2002.

Integrated Coastal Zone Management (ICZM) is a dynamic, multi-disciplinary and iterative process to promote sustainable management of coastal zones. It covers the full cycle of information collection, planning (in its broadest sense), decision-making, management and monitoring of implementation. During the preparatory stages of developing an ICZM approach for Bangladesh, the following development goal and objectives were identified:

Development goal

To create conditions in which the reduction of poverty, development of sustainable livelihoods and the integration of the coastal zone into national processes can take place.

Development objectives

The reduction and development of capabilities to cope with the vulnerabilities of coastal areas, building on the resilience of the people and environments of the zone.

The improvement of resource management in the coastal zone, based upon sustainable management processes and the realization of the under-utilized potentials of the area.

The empowerment of coastal communities, especially the poor and the women, through social and institutional development to improve equity and to integrate coastal communities into national processes.

The preservation of critical ecosystems and ecological processes in the coastal zone.

Project Start Date: 01 February 2002

Completion of the 1st Phase: 30 June 2006

4.3.2. Results and achievements made, with indicators if available

Outputs

Six defined outputs have been identified for the three-year period of the Program Development Office. Three of them are regarded as key outputs: the Coastal Zone Policy (CZPo); the Coastal Development Strategy (CDS); and the Priority Investment Program (PIP). The other three outputs are regarded as cross-cutting themes: the improvement of community capacities to enhance their livelihoods; an enabling institutional environment; and the knowledge base.

Coastal Zone Policy(CZPo)*:*

This basic structure of the CZPo may have four main sections, with each section to be further elaborated into a series of sub-sections. The structure is as follows.

Coastal policy for Bangladesh: an overview, Coastal development issues, Creating an enabling environment, and the management of coastal development.

The coastal development strategy (CDS)

The CDS will reflect the specific actions needed to achieve coastal development objectives, but will not be developed in isolation. In particular, links will be made to the content and process of the National Strategy for Economic Growth, Social Development and Poverty Reduction [ERD, 2002 and a three year rolling plan of the GoB] and to other national policy and planning processes (such as the implementation of the National Water Management Plan).

Priority Investment Program (PIP)

The priority investment program is consequently the operational arm of the strategy – the way that policy is put into practice. The fact that the prioritization process will relate each option to the different criteria for prioritization will allow a link between the options and the policies and priorities of different potential partners. For example, if a potential partner places emphasis on options that will create livelihood opportunities for and improve social cohesiveness within coastal communities, they will be able to identify which implementation proposals best suit these specific goals.

Improving community capacities for livelihood enhancement

The purpose of the livelihood component is to develop models of good practice to improve the capacity of communities to enhance their livelihoods. The challenge of this component is to translate the general objective of the ICZM project into practical priority actions that effectively contribute to the achievement of the overall goal of reducing poverty and vulnerabilities in coastal areas.

Creating an enabling institutional environment

This component aims to prepare for the institutional arrangements to be addressed in the CZPo, the CDS and proposals for implementation of the strategy. The basic structure is: harmonization as a process of accommodation and conflict resolution at national level of policy formulation and planning; horizontal co-ordination between agencies with regard to the implementation of policies and programs at national, district, upazila and union levels; and vertical coordination between the different levels from the local community through local government tiers to the national level.

Knowledge base

The purpose of the knowledge base component of the PDO-ICZMP project is to: gather, assimilate and make available data and knowledge on the coastal zone and livelihoods of coastal area dwellers for all stakeholders involved in developing and implementing ICZM; engage through a co-operative approach, organizations and projects involved in coastal development in constructing and maintaining a dynamic and sustainable knowledge system on the coastal zone.

The first phase developed the policy, strategy & also suggested arrangement and mechanism to prepare sustainable development in the Coastal Zone Policy, Bangladesh. Now is the time to pursue (through 2nd phase) development in line with policy and strategy which is yet to start.

4.4. Name of the initiative or programme**: Improved Adaptive Capacity to Climate Change for Sustainable Livelihoods in the Agricultural Sector of Bangladesh**

Implementing Agency: **Department of Agricultural Extension of Ministry of Agriculture and Food and Agricultural Organization (FAO) under CDMP**

4.4.1. Description, objectives and main activities:

Natural hazards like flood and drought have direct impact on Bangladesh agriculture and food security, which have triggered due to climate change and climate variability, thus have a negative impact on country's food security achievements. Under the CDMP Framework FAO in partnership with Department of Agricultural Extension, Ministry of Agriculture have undertaken this initiative in the drought-prone Northwest Bangladesh since 2005 with the following objectives:

1) To initiate and facilitate the field testing with farmers of:
   - livelihood adaptation strategies to better respond to disaster and climate risks,
   - improved long-lead climate forecasting, and responses to climate change predictions in agriculture
2) To develop a methodology to better understand:
   - how results of climate change impact modeling can be translated into agricultural response options and livelihood adaptation practices,
   - how these options can be locally tested and implemented in a participatory way with farmers,
   - how to feedback results into the agricultural and climate change community, and facilitate replication elsewhere.

The specific outputs to be delivered include:

Output 1: Project implementation groups established, capacitated and operational, and information flows addressed.
Output 2: Livelihoods adaptation and risk management analysis in the pilot sites undertaken
Output 3: Climate change risk and livelihoods adaptation option analysis in agriculture sector – option menu of technically viable practices prepared
Output 4: Methodology for livelihood adaptation elaborated and pilot tested

4.4.2.Results, achievement made with indicators if available:

The project established a good number of national and local level institutional frameworks for disaster risk management in agriculture.
A Plan of Action (PoA) for disaster risk management in Agriculture has been formulated.

The project started with climate change vulnerability and risk assessments along with the existing local to national institutional arrangements for disaster management including climate change impacts. A number of livelihood adaptation options were identified through consultation with farmers, field level extension workers and with the researchers for pilot testing in the irrigated and rainfed conditions. Similar tools were applied in developing the field testing methodology of the options identified. Currently a number of local level agricultural adaptation options being tested in rainfed and irrigated conditions in the farmers' field. Maize is a new crop for the area which can be grown in irrigated condition with less water. There is an emerging market for maize and very profitable. Chickpea which is an additional crop can be grown in rainfed condition to be cultivated immediate after T-aman harvesting. The practice can increase the cropping intensity and improves the nutritional security and soil fertility. Promotion of Mango and Jujubi cultivation in relatively high lands is a new option being promoted under this project. The 5mx5mx2m miniponds are also suggested to the farmers to preserve the rainwater which can be used for supplemental irrigation in the T-aman field in case of water shortage due to low rainfall.

The project also developed a number of training modules and resource materials and provided training to around 200 DAE officials (both at local and head office level) and also for the farmers.

The indigenous practices identified through interaction with local level farmers and field level agricultural extension workers were refined through scientific knowledge and then disseminated through field level demonstrations.

The climate change impacts knowledge and information were communicated with the community through organizing orientation meetings, organizing field days, folk songs and dramas, demonstration rallies and exchange visits.

4.3.3. Major challenges and lessons in implementing the initiative or programme, and next steps planned:

Key lessons

At the Field level

- Many techniques and methods available for agricultural risk management are highly relevant in the context of climate change adaptation. No need to reinvent the wheel.
- Development, Disaster Risk Management and Climate Change Adaptation are closely related issues at the local level
- Institutional capacity building is key

- Indigenous knowledge; we need to integrate it with external “know how”

At the Policy level:

- The question remains open whether we can continue to use agriculture as poverty alleviation strategy
- Moving towards adaptation requires a livelihoods perspective
- We need comprehensive approaches: “WHO does WHAT and HOW best ?”
- Promote action research to develop new varieties and cropping patterns to respond to climatic risks

Hyogo Framework Priority for Action 5:
Strengthen disaster preparedness for effective response

The Bangladesh Initiatives

This section of the report describes the following programmes and initiatives been undertaken since the WCDR to strengthening the emergency response capabilities of government and its agencies:

5.1. Strengthening Search and Rescue Capabilities of the Government of Bangladesh: The DMB Initiative

5.2. Disaster Preparedness for Emergency Response and Recovery– The Programmes of the Directorate of Relief and Rehabilitation, Ministry of Food and Disaster Management

- 5.2.1. Test Relief & Food For Works
- 5.2.2. Vulnerable Group Feeding Programme
- 5.2.3. Relief and Rehabilitation Programme
  - 5.2.3.1. Relief Assistance
  - 5.2.3.2. Vulnerable Group Feeding
  - 5.2.3.3. Vulnerable Group Development Programme
  - 5.2.3.4. Food Security Enhancement Initiative (FSED) Programme
  - 5.2.3.5. Natural Disaster Risk Reduction Programme (NDRRP)
  - 5.2.3.6. Reducing Disaster Risks of the Poorest through Sustainable Livelihood Development

5.3. Capacity building of Bangladesh Fire Service and Civil Defence – The PEER Programme

5.1. Name of initiative and programme**:** Strengthening Search and Rescue Capabilities of the Government of Bangladesh: The DMB Initiative

5.1.1. Description, objectives, main activities of the initiative or programme

With rapid urbanization and increasing threat for earthquake the Government of Bangladesh felt the need to improve the search and rescue capability, more specifically, the need to procure more search and rescue equipments to deal with large scale destruction of infrastructure and also to strengthen the fire fighting capability of the Bangladesh Fire Service and Civil Defense. In January 2005, the Ministry of Food and Disaster Management through a vide office notification formed a Technical Committee comprising of 11 members drawn from various government and non-government agencies to review the suitability of the list of equipments proposed to procure to strengthen search and rescue operation in case of a possible earthquake. Based on the suggestions and recommendations the Disaster Management Bureau submitted a project and received approval from the ECNEC to phase out the procurement and go for procurement of the search and rescue equipment worthing Tk. 350 million. The Government has also received the same amount commitment from the Japan Government for this purpose.

5.1.2. Results and achievements made, with indicators if available

Disaster Management Bureau has initiated the tendering process to be published in the daily newspapers.

5.2. Name of the Initiative**:** Disaster Preparedness for Emergency Response and Recovery– The Programmes of the Directorate of Relief and Rehabilitation, Ministry of Food and Disaster Management

5.2.1. Description

The Ministry of Food and Disaster Management (MoFDM) is responsible for overall coordination of disaster response and preparedness. The Directorate Relief and Rehabilitation (DRR) as an operation wing of the ministry is responsible for coordination and management of response and operations respectively, at the national level. Similar responsibilities lies to district, sub-district and at the Union by the respective disaster management committees.

The Directorate of Relief and Rehabilitation (DRR)

Immediate after liberation the then Relief Department of East Pakistan started its function to rehabilitate the war affected and homeless people and to reconstruct the devastated economy which ultimately emerged as the Directorate of Relief and Rehabilitation (DRR).

DRR was established in 1983 vide Government Notification No. RRD-Sec-Admn-1/67/82/35 dated 09-01-1983 under the Ministry of Disaster Management and Relief (Now Ministry of Food & Disaster Management). The Directorate has five Wings under five Directors – who are supported by Deputy Directors, Engineers and Assistant Directors. The major programmes of DRR and their descriptions are given below:

5.2.1. Test Relief & Food For Works

Test Relief (TR) programme is mainly for immediate repairing roads, damaged institutions, and other rural activities. On the other hand, Food For Works (FFW) programme is for construction, reconstruction, maintenance & development of rural infrastructure. Under the said two programmes food grains/ cash money are allocated by the MoFDM to the Upazilas (sub-districts) of the country. The schemes are executed by the Upazila Parishad under the supervision of the Deputy Commissioner (head of the district's civil administration) through the District Steering Committee. Normally, each Upazila Parishad divides the allocated rice/wheat/cash money for TR/FFW schemes to all unions under it on the basis of their population and vulnerability. Then, the concerned Union Parishads prepare TR/FFW schemes and present the same to Upazila Parishad for getting final approval from the competent authority. Upazila Parishad on scrutinizing prepares list of the selected schemes and presents it before the District TR/FFW Committee for sanctioning approval. At this stage, District TR/FFW Committee convenes regular/ special meeting for taking decision on the proposals and sanctioning final approval if required. However, after getting approval of the schemes from the District TR/FFW Committees, the concerned Upazila Parishads execute those schemes through union parishads as per circular.

Both TR and FFW programmes are well considered as disaster preparedness strategy from the part of GoB as it is well recognized that the said programmes are significantly facilitating the poor people of rural areas with regard to their livelihood security by giving them the opportunity to engage themselves in income earning job during the hardship phase of lean non-agricultural period.

Challenges

The performance of the said programmes mostly depends on the commitment of the political leaders and concerned local government representatives. If the political leaders (basically the members of parliament) infiltrate themselves in the process of the allocating food grains/ cash money in favour of their constitutional area to earn illegitimate personal gains and influence the executors of the programmes (basically the local government representatives) to fulfill such desires, the programmes fail to reach the targeted results.

Strategy to overcome

To overcome this problem, the present care taker government of Bangladesh has recently adopted special provisions. Under the said provisions, the political leaders are now excluded from the process of allocating upazilla-wise budget and they are also exempted from the Upazila TR/FFW programmes execution committee. We can reasonably expect that the recent provisions will be helpful in achieving targeted results.

5.2.2. Vulnerable Group Feeding Programme

Vulnerable Group Feeding (VGF) is a form of gratuitous relief. This programme is normally launched during disaster and after disaster till the distressed people remain vulnerable to hunger. It provides food assistance amounting 10 Kg to 20 Kg of rice per month for 1 to 3 months to almost all the disaster affected/vulnerable families after all major diastral incidences and during the period of food scarcity. However, GoB under its budgetary provision distributed food grains amounting amounting 0.124 million MT valued tk.2055 million among 63,01,222 beneficiaries in 2005-20006. Similarly in the on going fiscal year (2006-2007) an amount of 0.23 million MT food grains valued tk.3799 million among 76,82,434 beneficiaries has already been distributed till today.

VGF programme is well thought as disaster preparedness strategy from the part of GoB. Because, it is helping the poor people of rural areas as well as other disaster victims in a manner so that they can successfully overcome the phase of their falling into vulnerability by consuming the food grains received under this programme.

Challenges

the success of this programme largely depends on the selection procedure of VGF beneficiaries. If the union VGF committees (basically the local government representatives) refrain themselves from selecting the deserving beneficiaries out of their personal interest, the programme will definitely fail to reach the targeted results.

Strategy to overcome

To overcome this problem, GoB has adopted special provision of engaging the armed forces in the process of resolve the accuracy of VGF cardholders by empirical verification. Sincerely, the said provision has already been recognized as a successful measure in achieving targeted results.

5.2.3. Relief and Rehabilitation Programme

This is a disaster management programme of the Government/Directorate. The main objective of this programme is to meet the emergent needs of the situation. Relief works is undertaken in three phases:- Pre-disaster; Disaster period and Post Disaster period.

5.2.3.1. Relief Assistance

The Directorate of Relief and Rehabilitation provides the following disaster relief with the approval of the Govt.:-

- G.R food/ G.R cash.
- C.I. sheet or House building grant.
- Temporary arrangement of shelter for the distress people during the disaster.
- Winter cloth like blanket etc.
- Tent.
- Sari, Lungi, etc.
- Dry Food – Chira, Gur, High protein biscuit, Soya biscuit, dates etc.
- Baby Food, Milk Powder.
- Utensils
- Medicine/Medical assistance etc.

5.2.3.2. Vulnerable Group Feeding

VGF is a form of gratuitous relief. This programme is normally launched during disaster and after disaster till the distressed people remain vulnerable to hunger. It may be stated that the WFP started its relief activities as VGF Programme in Bangladesh among the poorest women from 1975 under project BGD 2226.

5.2.3.3. Vulnerable Group Development Programme

VGF has been over the years, transformed into Vulnerable Group Development (VGD). The World Food Programme is the major donor of this programme implemented through NGOs since 1980. About 7,50,000 women families are

getting benefit in each two-year cycle under which each family receives 30 kg of wheat per month. The package also includes:

1. Facilitate training into marketable skills,
2. Encourage the accumulation of seed capital through serving and provide access to credit in order to, build increased earning capacity, and enable them to "graduate" into on-going development programmes.
3. Enhance social awareness through active participation of poor women in groups for functional education and other human development skill training.
4. Improve socio-economic conditions of the poorest women in rural Bangladesh so that they may:

    - more beyond their existing status marked by food insecurity, economic insecurity, and low social status,
    - be able to sustain themselves above the poverty level after further 4 to 5 years period of support beyond VGD graduation from NGO's such as BRAC.
    - The programme is being implemented by joint collaboration with the Ministry of Women Affairs.

Challenges

The success of this programme equally depends on the selection procedure of VGD beneficiaries and on the issue of providing them sufficient training on awareness raising as well as income generating schemes. If the union VGD beneficiaries are not properly selected and if they are not provided appropriate trading by the partner NGOs, we can not guess expected results from VGD programme.

Strategy to overcome

GoB has adopted the provision of engaging the representatives from concerned government agencies, donors and partner NGOs in the process of selecting VGD cardholders.

5.2.3.4. Food Security Enhancement Initiative (FSED) Programme

As per agreement, (signed between MoFDM on 3rd July 2000) DRR is implementing two types of work viz. Road Development and Ground Raising programme jointly with World Vision Bangladesh in 16 Upazila thoughout the country under this Programme.

The duration of the programme is from October 2000 to September 2005. Targets of the programme are Construction and Development of road and Ground raising of school, college, market or other public places from 10 decimal to 150 decimal area each. For implementation of the above two programmes, and other components like road-side-tree plantation. Wheat, Peas and Edible Oil provided by USAID are used to implement this programme.

5.2.3.5. Natural Disaster Risk Reduction Programme (NDRRP)

As part of post-Flood 2004 recovery in December 2004 the Directorate started implementation of the programme as an assistance to the disaster affected micro entrepreneurs to regain their lost assets. Under this programme a beneficiary receives financial assistance within the range of Tk. 5,000 to Tk 20,000 of which 15% is grant and 85% is loan depending on the severity of loss. The loan amount is repayable within 3 year period with an annual 5% flat interest rate.

Along with the financial assistance the beneficiaries of this programme are also provided awareness raising training on disaster preparedness. The assistance are provided on the following schemes:

- Handloom/ cottage industry;
- Boat/ Rickshaw/ Cycle-van/ other Non-motor vehicles;
- Nursery/ Small garden of fruits;
- Poultry and Cow rearing;
- Scheme on small scale pisciculture and
- Any scheme of small trading having self-employment opportunity for the women.

Since the inception of this programme in 2004-2005, tk. 1347 million has been allocated under which tk 876 million has already been distributed among 118,819 beneficiaries.

Lessons Learned

- Non-availability of reliable data on per capita monthly income of the people living in the disaster prone areas is a problem of beneficiaries' selection procedure;
- Failure in selecting appropriate income generating trades and lack of training may lead the schemes unsuccessful and turn the loan into a burden in maximum cases;
- Lack of supervision may leads the beneficiaries to misuse loan deteriorating their coping mechanism as well as capacity of regaining the economic solvency;
- Repayment of loan instalment will not be ensured unless competent person/ persons are engaged for supervision and realization of loan from the beneficiaries;
- To sustain the programme co-operation as well as coordination among the concerned persons and agencies at all levels is highly required.
- It is noted that GoB is now trying to overcome all the said problems by taking appropriate measures.

5.2.3.6. Reducing Disaster Risks of the Poorest through Sustainable Livelihood Development

In order to reduce Disaster Risk of all kinds of natural disaster including River Erosion, the Government of Bangladesh has initiated a Project named "Reducing

Disaster Risks of the Poorest through Sustainable Livelihood Development". It is a new initiative of the Government that demonstrates national political commitment to support the poorest households at-risk living in the most disaster prone areas in the country to develop capacity to manage livelihoods and thereby address disaster risks. The Directorate of Relief and Rehabilitation is implementing this project from government's own resources (Tk. 50 Crore).

The objectives of the Reducing Disaster Risks of the Poorest through Sustainable Livelihood Development Project are

- Reducing Risks and enhancing the long-term development capacity of the poor vulnerable to natural disasters;
- Reducing Poverty by improving the economic status of the poor who are vulnerable to natural disasters to an extent that ensures they do not require support from Relief programs in future;
- Sustainable Development by enabling access to development resources and services for long-term resilience of the targeted households;

The project integrates pre-disaster strategies, post-disaster activities and long-term policy development to reduce the impact of disasters on vulnerable populations by encouraging the maintenance of sustainable livelihoods. The project also demonstrates how to integrate and mainstream relief resources for the poor into their long-term development by reducing their risks to natural disasters. The poorest most vulnerable to natural disasters cannot recover from the damages of natural disasters only on relief resources. The project started operating in 2006 in 12 poverty stricken districts.

The amount of fund given to each beneficiary under this programme in terms of grant and loan ranges from Tk. 5000 to Tk. 10,000 of which 20% is grant and the remaining 80% is loan repayable with 5% service charge.

5.3. Name of the Initiative**: Capacity building of Bangladesh Fire Service and Civil Defence – The PEER Programme**

5.3.1. Description

In March 2003, Bangladesh joins with the India, Indonesia, Nepal and the Philippines as the fifth partner country in the PEER program. PEER is a five-year regional training program (2003-2008) of the Agency for International Development Office of U.S Foreign Disaster Assistance (USAID/OFDA) that is implemented by the National Society for Earthquake Technology-Nepal (NSET). In May 2004, PEER-Bangladesh is launched at the first Country Planning Meeting in Dhaka hosted by the MoFDM. Fire Service & Civil Defence is designated Host Training Institution for Medical First Responder (MFR) and Collapsed Structure Search and Rescue (CSSR) programming in Bangladesh.Under this program, the relevant employees of Bangladesh fire service and civil defense have been receiving training on CSSR and MFR mainly on earthquake and fire hazard. Under PEER, training also have been provided to Bangladeshi doctors and nurses under Hospital Preparedness for Emergency (HOPE) programme.

Objective

To build up capacity of the fire fighters working in Bangladesh Fire service and Civil Defense organization getting training in home and abroad. In order to develop human-resources, the professional who got training will train the professional of the relevant government organization and the volunteers of the community.

5.3.2. Achievements:

So far, 100 personnel of Bangladesh Fire Service and Civil Defense have been trained under PEER programme. Theses trained personnel are providing training to the official of other organization. Bangladesh Fire service and Defense also organize 3-days training for the garment workers on the fire hazard awareness, search and rescue works and first aid activities. So far, Bangladesh Fire Service and Civil Defense provided training to the workers of 40 garment industry in Dhaka. This organization is providing same training in Chittagong city. More than 33 doctors and nurses have been trained so far under HOPE programme.

5.3.3. Major challenges:

After the sudden collapse (2004) of a Garment industry in Savar area of Bangladesh, it was found that the present trained man-power and the instrumental strength to operate search and rescue works both in arm forces and Bangladesh Fire Service and Civil Defense are mostly inadequate. The strength of these organizations in terms of trained people and instruments should be increased immediately. Recent number of fire hazard in the garment industry and other offices and houses implies that launching of immediate awareness raising activities are very impotent to reduce the events and casualties caused of this hazard.