

Earthquake and Tsunami Preparedness Program in Bangladesh

(For Dhaka, Chittagong and Sylhet City Corporation Areas)

Preamble

Comprehensive Disaster Management Program (CDMP) is being implemented by the Ministry of Food and Disaster Management (MoFDM) with funding assistance provided through the United Nations Development Programme (UNDP), UK Department for International Development-Bangladesh (DFID-B) and the European Commission (EC). CDMP has been designed to strengthen the Bangladesh Disaster Management system and more specifically to achieve the paradigm shift from reactive response to a proactive risk reduction culture. CDMP seeks to raise the capacities of at-risk communities while lowering their vulnerability to specific hazards as well as to serve as a good risk management model for the region.

Asian Disaster Preparedness Center (ADPC), Thailand has been commissioned for implementing some of the sub components of a project on “Earthquake Risk Assessment and Preparedness in Dhaka, Chittagong and Sylhet City Corporation areas”. ADPC has contributed to the advancement of disaster risk management practice and promotion of the culture of safety in different thematic areas in Asia. During the last 20 years, in addition to capacity building initiatives, ADPC implements programs and projects at national and regional level under various thematic areas.

Program Profile

Urban Disaster Risk Management (UDRM) Team of ADPC under CDMP is currently implementing a program in Bangladesh to promote Earthquake risk reduction interventions in three cities namely Dhaka, Chittagong, and Sylhet. The program consists of four components namely:

- Contingency Planning with Regard to Earthquake Hazard;
- Information Inventory and Data Sharing;

- Seismic Hazard and Vulnerability Mapping;
- Training, Advocacy and Awareness with Regard to Earthquake and Tsunami Hazard;

With regard to component 5b, ADPC is implementing another project titled- “Support for a Disaster Management Information Network (DMIN).

Contingency Planning with Regard to Earthquake Hazard

Statement of Work (SOW)

- *Activity I:* Determine status of contingency planning and design of interim contingency plan;
- *Activity II:* Turn interim contingency plans into final versions (using maps for selected urban areas that highlight earthquake-vulnerable school/hospital/emergency response and control buildings etc.);

Prevailing Status as Measured against Activities

The First City Level Workshop on “Contingency Planning with regard to Earthquake Hazard” was held on 19 May 2008 and in Chittagong. This was the inaugural workshop that aims to build an initial consensus among relevant stakeholders at city level. It is to be mentioned that different interactive working group meetings have already been conducted at national level.

The Honorable Mayor Al-Haj M Monjur Alam (a.i.), Chittagong City Corporation kindly made an opening speech as the Chief Guest to grace this inaugural workshop. Prof. M.A. Wahhub Chawdhury, Principal of Chittagong City Corporation, and Brigadier General Anwar Farid (Retd.) joined the Meeting as the

Special Guest. To reach in a common consensus for addressing Earthquake issue effectively, many stakeholders gathered together including Fire Service and Civil Defence, utility service providers, Chittagong Medical College, Bangladesh Railway, Chittagong City Corporation, Ward Commissioners, Armed Forces Division, various NGOs, media etc. The aim of this workshop was to organize an interactive discussion forum among all respective stakeholders, which are involved in any of the steps of Earthquake Risk Management Process including preparedness, mitigation, operations response, recovery etc. These Workshops are expected to make some presentations on their roles and responsibilities with regard to earthquake hazard and to introduce initial discussions on the way of formulating earthquake Contingency Plan at City level. The Discussion Forum establishes the ground rules for contingency planning process. Specifically, the objectives of this workshop are to:

- To explain general objectives, methodologies, conceptual framework and statement of work of this project
- To share national level activities and outcomes so far made in the preparation of contingency plan.
- To facilitate a group discussion session for situation analysis on the identification of prevailing scenario at City level.



The Honorable Mayor Al-Haj M Monjur Alam (a.i.), Chittagong City Corporation initiated the inaugural Workshop on Contingency Planning in Chittagong; 19 May 2008.

The workshops have been structured into two sessions. In the Plenary Session, some

introductory presentations would be made on the background, objective, and activities of the project. Furthermore, a visual presentation on 'Earthquake risk and learning from the past earthquakes in Asia Region' has been conducted by Mr. Binod Shrestha, representative of Nepal Society for Earthquake Technology (NSET). Another presentation on 'Scenario based Contingency planning: Its Scope and Needs' has been conducted by Mr. N.M.S.I. Arambepola, Director of Urban Disaster Reduction Management (UDRM)- ADPC, which follows an interactive discussion to make overall comments and suggestions towards formulating Earthquake Contingency Plan at city level. The knowledge gained from the prevalent disaster management structure with regard to earthquake contingency plan have been discussed among all relevant and allied stakeholders involved in addressing earthquake hazard in Bangladesh. In the Group Discussion Session, the participants have been grouped into the following 4 functional clusters to facilitate gap analysis on evaluating prevailing situation at city level.

- **Cluster I-** Urban Crisis planning group (Emergency operation center, Coordination with others including media, logistics support for responding to the event)
- **Cluster II-** Relief services Group (Evacuation, food & water supply, temporary shelter, welfare of victims)
- **Cluster III-** Health and welfare (Search & Rescue, Emergency medical care)
- **Cluster IV-** Restoration of facilities (water, electricity, roads, telecommunications, gas etc.)

Group-specific rapporteurs have been assigned to compile all key outputs of the workshop including- what needs to be done, identification of priority actions against each functional activities at preparedness, response, and recovery phase. All 4 clusters came up with the expected outcomes in consistent with overall goals of the meeting, and the outputs group discussions have been presented by the representatives of each concerned cluster.

The same methodology has been followed to organize the First City Level Workshop on "Contingency Planning with regard to Earthquake Hazard" that was held on 21 May 2008 and in Sylhet. This was the inaugural workshop that aims to build an initial consensus among relevant stakeholders at city level. The Honorable

Mayor Mr. Md. Azam Khan (a.i.), Sylhet City Corporation kindly made an opening speech as the Chief Guest to grace this inaugural workshop. To reach in a common consensus for addressing Earthquake issue effectively,

many stakeholders gathered together including Fire Service and Civil Defence, utility service providers, Chittagong Medical College, Bangladesh Railway, Chittagong City Corporation, Ward Commissioners, Armed Forces Division, various NGOs, media etc.

To meet the revised deadlines for the deliverables, The ADPC Contingency Planning Team successfully accomplished the documentation process of development of interim contingency planning template for national, city and agency level that included the following informative analyses:

- Present organizational structure for natural disaster reduction policy making
- Present organizational structure and preparation for earthquake vulnerability reduction
- Development of interim planning templates at various levels

Furthermore, another report has been formulated highlighting on the responsibilities of the disaster related professional and planner inside the organization.

Next Steps

It is planned that the first City Level Inaugural Workshop on Contingency Planning would be held on 9 June 2008 in the Conference Room of Dhaka City Corporation. After that, the First Working Group Workshops would be organized in Chittagong, Sylhet and Dhaka respectively. Besides, many cluster-based meetings are also expected to be conducted with relevant key stakeholders frequently.



The Honorable Mayor Mr. Md. Azam Khan (a.i.), Sylhet City Corporation initiated the inaugural Workshop on Contingency Planning in Sylhet; 21 May 2008.

Seismic Hazard and Vulnerability Mapping

Statement of Work (SOW)

As encapsulated in the terms of Reference of the project, the activities of this technical assignment (TA) is mainly to develop seismic hazard maps, and vulnerability, maps for the critical infrastructure as well as the building stocks of Dhaka, Chittagong, and Sylhet city corporation areas. This study will also undertake damage estimation for scenario events so as to assess damage probabilities and provide informed insight about the risks involved.

The SOW consists of four main complementary activities. Two of the objectives related to Remote Sensing and GIS data unit (Geology and Fault mapping, Geotechnical Investigations) are listed as follows:

- Prepare regional and local geological fault maps.
- Prepare engineering geological maps for three cities (Dhaka, Sylhet and Chittagong City Corporation areas)
- Prepare seismic hazard maps for 3 cities by providing seismic, geological and ground conditions.
- Prepare seismic vulnerability and risk maps for three cities by providing information on vulnerability and risk conditions of critical infrastructures.

Prevailing Status as Measured against Activities

Seismic hazard assessment: Reconnaissance surveys were done to study active faults in different parts of



Bangladesh for the purpose of seismic hazard and vulnerability assessment.

There were several field works for active fault and shallow seismic survey in different districts together with EC delegates, OIC, TAG, CDMP and DU representatives.

- Field preparation was done in four field works (in Tangail, Dhaka, Comilla, Chittagong, Cox's Bazar, Hobigonj and Sylhet district) together with CDMP.
- Field work on active fault study in Ghatail & Kalihati upazila, Tangail District was done in 1st May with OIC (Mr. Reza, Mr. Morino), Dr. Maksud (CDMP), Mr. Zillur (DU)
- Small scale Micro-tremor and surface wave survey in Dhaka for the recording of ambient vibration (shallow seismic micro-tremor survey) and surface wave of the ground in Dhaka (data collected at 12 locations so far).
- Field work for active fault study was carried out in Comilla, Chittagong and Cox's Bazar district with TAG member, OIC, CDMP, DU and ADPC from 7th to 10th May.
- Monitoring of Small scale Micro-tremor and surface wave survey in Chittagong was done by EC, TAG and CDMP representatives in 8th May.
- Field work for active fault study in Hobigonj and Sylhet district together with TAG, OIC, CDMP, DU, ADPC members.
- Data collection for active fault study and data preparation, database development and GIS maps for OIC.

Field data collection: Small scale Micro-tremor and surface wave survey in Dhaka and Chittagong was carried out with ADPC partners, DU and OIC. In Dhaka

shallow seismic data were collected from 12 locations and in Chittagong from 9 locations.

Future plan: Preparations are made to perform borehole drilling, PS logging and shallow seismic

survey in 3 cities (Dhaka, Chittagong and Sylhet).

Building Survey for Vulnerability factors: In Dhaka, total 6080 buildings in 64 wards surveyed for phase I preliminary survey and 608 buildings are surveyed for phase II (detail survey).

Total Target: 9000 buildings for preliminary survey in 90 wards of Dhaka City Corporation and 800 buildings for detail survey. So around 70% work is done.

In Chittagong, 800 buildings in total of 6000 are surveyed (start from 7th May). Around 15% work is done.

In Sylhet, 100 buildings in total of 5000 surveyed (start from 21st May). Around 5% survey is done.

Building survey Data Entry: Around 4300 building survey data entered in GIS format also in specified format by NSET in Dhaka (start from 24th April). CUET and SUST is progressing their data entry respectively.

Remote Sensing and GIS data: As encapsulated in the terms of Reference of the project, the activities of this technical assignment (TA) is mainly to develop seismic hazard maps, and vulnerability, maps for the critical infrastructure as well as the building stocks of Dhaka, Chittagong, and Sylhet city corporation areas. This study will also undertake damage estimation for scenario events so as to assess damage probabilities and provide informed insight about the risks involved.

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objectives related to Remote Sensing and GIS data unit (Geology and Fault mapping, Geotechnical Investigations) are listed as follows:

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This is important to note here that 1 and 2, will be done by OIC (OYO International Corporation, Japan) and Remote Sensing and GIS team ADPC, Dhaka is responsible to give support with GIS data for final analysis.

Prevailing status as measured against activities:

Prepare regional and local geological fault maps: Remote Sensing and GIS data team is continuously developing the data base to support the Seismic Hazard Mapping team. The ongoing works at hand are as follows:

- a. Topography Map of Chittagong City Corporation area.
Output: Georeferenced Topography Map in TIFF Format.
Methodology: Topography map of Chittagong were collected from BIWTA (Bangladesh Inland Water Transport Authority) at 1:10000 scale, in 30 separate sheets. All the sheets were georeferenced using the existing geographic coordinates on each of the maps in BTM projection.
- b. Waterbody extraction for Dhaka and Chittagong areas:
Output: Shapefile.
Methodology: Existing Topography maps are used for waterbody extraction. A faster and accurate method of extraction is being used to avoid digitization. All the Topography images have been classified and a single class of waterbody has been recorded using unsupervised classification technique. Few edits are needed for finalizing the waterbody to exclude the dotted lines for Marshy areas. These are representative to the existing waterbodies areas from the topography maps.
Finally all the waterbodies will be updated from QuickBird images to get

the latest area covered. Presently, extraction of Dhaka is ongoing. Same process will be followed for Chittagong areas.

- c. Contour from SRTM DEM (90m)(Bangladesh):

Output: Contour for whole Bangladesh in shapefile.
Methodology: Contour lines were drawn using spatial analyst tool in ARC GIS 9.2 using a contour interval of 10m and 100 m.

- d. DEM from Spot Heights(Chittagong):

Output: Contour line, DEM
Methodology: Spot heights are being captured to produce the final DEM and Contour. Some elevation points will also be collected along the river lines from the existing contour lines.

Training, Advocacy and Awareness with Regard to Earthquake and Tsunami Hazard

With regard to training, advocacy and awareness phase, it is to be noteworthy to mention that a detailed inception report has been submitted to CDMP and also presented in the TAG meeting in mid of February 2008.

Objectives

The objectives of this component are mainly to develop training, drills, advocacy and awareness in different cross sections of the people from the government officials to the community level in Dhaka, Chittagong and Sylhet city cooperation including their area under future extensions.

Prevailing Status as Measured against Activities

Inception of the interventions: As ADPC signed the agreement with CDMP, ADPC worked and chalk out the methodology for the training, advocacy and awareness project. Each component of activities was elaborated with sub activities and also specific methodology in the inception report for the clear understanding of the implementation. The revised work schedule also presented to CDMP. During the TAG meeting and comments received from the TAG members ADPC has revised

the inception report and submitted to the CDMP as final report.

Staff recruitment: ADP has hired Project manager and he is on board from February 2008. The team also supported with on project coordinator and also field coordinators to initiate the activities of the project. For new team members an orientation has been made to create common understanding among all team members.

Partnership building: ADPC has made partnership agreement with N-SET Nepal and BDPC to assist ADPC in Training and advocacy interventions such as masons training, schools teachers training, decision and policy makers training, religious leaders training, KAP analysis, documentary (video) production and material development for training and awareness raising.

KAP analysis: Field survey and data collection completed during the month of May 2008. Focus group discussions, with masons, teachers and religious leaders were conducted in three targeted cities.

The representatives of different government departments were also involved in the discussions. Two detailed reports will be produced based on the results of the KAP exercise. First report "training needs of training target groups" is due by June 2008. The second report will be submitted to CDMP by July 25, 2008 on communication strategy for the advocacy and information dissemination.

Material Development: ADPC with the technical support of its partners N-SET and BDPC is being developed. First draft training material for religious leaders has been submitted to CDMP on May 25, 2008 for comments and suggestions. The training material and manual for masons training will be submitted to CDMP on June 5, 2008. Draft material for the masons training developed in English and after comments and suggestion from CDMP it will be translated in the Bangla.

Development of video documentary: As essential tool for awareness raising and advocacy purposes a video documentary is the part of the project interventions. First draft script of documentary developed and

submitted to CDMP on May 25, 2008 for comments and suggestions. The script was developed in English and after finalising it will be translated in the Bangla.

Coordination and Meetings: On May 14, 2008 meeting held with Mr. Nittaya Gopal Das, Senior Instructor, Fire Service and Civil Defence, Training Complex. The main purpose of the meeting was to get information, knowledge about training material and manuals on fire safety and evacuation. During the discussion future possibilities of cooperation and technical assistance for the training of managers of critical infrastructure and training material were discussed. The meeting was concluded and agreed that ADPC will arrange meeting with DG fire services and civil defence for formalisation of future cooperation.

Support for a Disaster Management Information Network (DMIN)

Project Goal

- To implement an effective information sharing system to be operational among the disaster management agencies and communities for all hazards and in all sectors in all normal and emergencies times throughout the nation and regionally to support sustainable risk reduction and emergency response capacity.

Objectives

- A disaster management Network is operational and demonstrated down to the household level;
- Hazard messages "links" are effective (both ways- from data sources to household) to occur through an integrated information dissemination, coordination system;
- Disaster preparedness messages are successfully transmitted through one fully integrated hazard risk communication network.

As per TOR and technical proposal, ADPC is responsible to implement activity 1.1 to 1.5, and activity 2.1 on the whole.