

# Disaster risk in public education system in Bangladesh: emphasis on tornado

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**ABSTRACT:** Achieving paradigm shift from conventional response to comprehensive risk reduction was targeted by Comprehensive Disaster Management Programme (CDMP). CDMP is a programme of Government of Bangladesh and UNDP supported by UK Aid and EU. During phase-I (2004-2009) initiatives have been undertaken in the focus area “professionalizing the disaster management system”. A substantial progress has been made in incorporating disaster risk reduction (DRR) issues in education system. This paper highlights the progress and achievements on incorporation and institutionalization of DRR in Bangladesh education system. Issues on hazards, vulnerability, DRR measures have been placed in various text books from elementary-secondary to tertiary level of education. Different certificate courses, post-graduate diploma courses, Bachelor of Science (Hons.) and Masters in disaster management have been introduced in different public and private universities, in close cooperation with concerned Institutes. Besides research areas have been identified and carried out some researches through student-internship, Masters and PhD thesis.

**KEYWORDS:** Public Education, Research, Disaster Risk Reduction and Institutionalization

## 1 INTRODUCTION

The regulatory and institutional frameworks of Bangladesh Disaster Management System have strengthened country’s disaster management capacities which are acknowledged by many other nations. Challenges were to have a paradigm shift from a reactive disaster response programme to proactive comprehensive risk reduction approaches, programme designing and implementation. During CDMP phase-I, a substantial progress has been made in this area e.g. by drafting the Disaster Management Act, the national Disaster Management Policy and National Disaster Management Plan considering the Hyogo Framework for Action (HFA, 2005). Furthermore, the existing Standing Order on Disasters (SOD) has been reviewed by a committee formed by Ministry of Food and Disaster Management (MoFDM).

Many public sectors officials posted for different disaster management agencies/responsibilities have experienced at some time in their careers the impact of flood or cyclones, they may not necessarily have the broader knowledge, skills set and experience required to enable them to drive strategic whole government risk reduction initiatives. They were targeted to provide trainings to carry out existing/future tasks. In view of the longer term vision, it is important to strengthen the competency (*knowledge, skills and attitude*) of the peoples working in the national government system, hence a ‘Learning and Development Strategy’ of MoFDM has been drafted and substantial progress has been made in implementing the activities under the strategy.

### 1.1. Objectives

#### 1.1.1 Wider Objectives

To achieve capacity enhancement on comprehensive risk reduction approach, programming and implementation aspects of the officials of MoFDM, its line agencies and concerned sectoral departments, agencies and institutes which is in line with the National Education

Policy, National Training Policy and in accordance with the draft Learning and Development Strategy and Training Strategy of MoFDM.

### 1.1.2 Specific Objectives:

- 1.1.2.1 Support to provide professionals in the sectoral ministries for drafting and finalizing disaster management plan(s), guidelines, and carrying out activities to integrate DRR in the ministries and departments of agriculture, infrastructure, health, local government, environment and forest sectors.
- 1.1.2.2 Support to National Curriculum and Text Book Board (NCTB), public and private universities, and research institutes (under DM education and training network) to strengthen the capacities to incorporate risk reduction issues in existing courses, degree programme and to introduce new courses and carry out research initiatives
- 1.1.2.3 Support to public and private training institutes and academies to strengthen the capacities to incorporate risk reduction in existing training programmes, courses, and to introduce sector specific new training courses for different cadre services, NPO and NGOs
- 1.1.2.4 Development of e-learning tools and techniques on disaster management

## 2 PARTNERS ACTIVITIES

Under the programme memorandum of understanding (MoU) has been signed with the following partners to share knowledge, resources and experience on DRR issues. The list of Institutes and tasks is outline in Table 1.

Table 1. CDMP partners on incorporation of DRR in the education system in Bangladesh

National Curriculum and Text Book Board (NCTB), Ministry of Education	To incorporate, different risk reduction issues with special emphasis on natural disaster risk identification, risk prevention, mitigation, risk treatment and emergency response in the text books from elementary to secondary level, teachers training colleges.
Armed Forces Division (AFD), Prime Ministers Office	Director (Operations and Plans) of AFD is the focal point and Defence Service Command and Staff College (DSCSC), BIPSOT, are also in the partnership programme. To incorporate different risk reduction issues with special emphasis on evacuation, search and rescue, emergency relief and restoration service as first responding forces/team in all level of training and degree programme and develop tailored training course on disaster and emergency management fro armed forces.
University of Dhaka (DU)	There are three focal departments presently, Department of Sociology, Centre for Vulnerability and Disaster Studies and Department of Geography and Environment, Centre for Disaster Studies, and Institute of Social Welfare and Research (ISWR) to carry out research, Professional Certificate course, Diploma course and Masters in Disaster Management to incorporate risk reduction issues in other degree programme curricula, courses and in course contents.
University of Rajshahi (RU)	Institute of Environmental Science (IES) is the focal to carry out research, professional Certificate course, Diploma course and Masters in Disaster Management and to incorporate risk reduction issues in other degree programme curricula, courses and in course contents.

Jahangirnagar University (JU)	There are two focal departments presently, Department of Environmental Science and Department of Geography and Environment to carry out research, professional certificate course in Disaster Management and to incorporate risk reduction issues in other degree programme curricula, courses and in course contents.
Bangladesh Agricultural University (BAU), Mymensingh	There are three focal departments presently, Department of Environmental Science, Graduate Training Institute (GTI), and Department of Agricultural Extension Education (DAEE) to carry out research, professional certificate course in Disaster Management and to incorporate risk reduction issues in other degree programme curricula, courses and in course contents.
Khulna University (KU)	There are three focal disciplines presently, Environmental Science Discipline, Urban and Rural Planning Discipline, Biotechnology and Genetic Engineering Discipline to carry out research, Professional Certificate course, Diploma course and Masters in Disaster Management to incorporate risk reduction issues in other degree programme curricula, courses and in course contents.
Patukhali Science and Technology University (PSTU)	Department of Environmental Science and Disaster Management (DESDM) is the focal point to carry out research, Professional Certificate course, Bachelor of Science in DM and Masters in DM and to incorporate risk reduction issues in other degree programme curricula, courses and in course contents.
Mawlana Bhashani Science and Technology University (MBSTU), Tangail	Department of Environmental Science and Resource Management (ESRM) is the focal to carry out research, professional Certificate course, and to incorporate risk reduction issues in other degree programme curricula, courses and in course contents.
Shahjalal University of Science and Technology (SUST), Sylhet	Department of Environmental Engineering (DEE) is the focal to carry out research, professional Certificate course, and to incorporate risk reduction issues in other degree programme curricula, courses and in course contents.
Chittagong University of Engineering and Technology (CUET)	Department of Civil Engineering (DCE) is the focal to carry out research, professional Certificate course, and to incorporate risk reduction issues in Diploma Engineering and Bachelor degree (Engineering) programme curricula, courses and in course contents.
Independent University Bangladesh (IUB), Dhaka	Department of Environmental (DES) is the focal to carry out research, and Post-Graduate Certificate course in leadership and Management, and to incorporate risk reduction issues in other degree programme curricula, courses and in course contents.
BRAC University (BRAC-U), Dhaka	Post-Graduate Programme in Disaster Management (PPDM) is the focal to carry out research and Masters in Disaster Management, and to incorporate risk reduction issues in other degree programme curricula, courses and in course contents.

Table 2. CDMP partners on incorporation of DRR in the Training Institutes in Bangladesh

Bard Academy for Rural Development (BARD), Kotbari Komilla	To incorporate, different risk reduction issues with special emphasis on natural disaster risk identification, risk prevention, mitigation, risk treatment and emergency response in the foundations training of all Bangladesh Civil Service (Cadres) and have special session on other training course curricula and contents and develop “disaster management for sustainable rural development” tailored training module.
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Rural Development Academy (RDA), Sherpur, Bogra	To incorporate, different risk reduction issues with special emphasis on natural disaster risk identification, risk prevention, mitigation, risk treatment and emergency response in the foundations training of all Bangladesh Civil Service (Cadres) and have special session on other training course curricula and contents and develop “disaster management for sustainable rural development” tailored training module.
National Academy for Educational Management (NAEM)	To incorporate, different risk reduction issues with special emphasis on natural disaster risk identification, risk prevention, mitigation, risk treatment and emergency response in the foundations training of Bangladesh Civil Service (Education Cadre) and have special session on other training course curricula and contents and develop “disaster management for educational management” tailored training module.
BCS Administration Academy, Shahbagh, Dhaka	To incorporate, different risk reduction issues with special emphasis on natural disaster risk identification, risk prevention, mitigation, risk treatment and emergency response in the foundations training of Bangladesh Civil Service (Administration Cadre) and have special session on other training course curricula and contents and develop “disaster management for civil service administration” tailored training module.
Bangladesh Public Administration Training Centre (BPATC), Savar Dhaka	To incorporate, different risk reduction issues with special emphasis on natural disaster risk identification, risk prevention, mitigation, risk treatment and emergency response in the foundations training of all Bangladesh Civil Service (Cadres) and have special session on other training course curricula and contents and develop “disaster management for sustainable development” tailored training module.

### 3 PROGRESS AND ACHIEVEMENTS

#### 3.1 Training & Education

One of the important initiatives of the MoFDM through CDMP is Human Resource Development (HRD) in its plan which includes the inclusion of disaster management in the curriculum of schools and professional education system.

#### 3.2 Disaster management in elementary and secondary text books

The NCTB has introduced the issues of natural and human induced hazards, vulnerability, risk and disaster preparedness in different chapters of the subjects on Disaster Management in different books e.g Social Sciences, General Science, Bangla, English, which is being reviewed now in order to further incorporation considering re-defining risks and of new and emerging issues like climate change (CC) and other related issues is being incorporated after a periodical interval..

Table 3. Disaster management related issues in text books of Bangladesh education (Sifat 2008 and Hashfia Basirullah 2008)

Class	Text	Title	Subject matter	Remarks
V	Bangla English General Science	1. Cyclone 2. Improved Burner (Chula) 3. Environmental Pollution	A poetry on Cyclone	3. Reasons of environmental pollution and its impact
VI	Social Science (14 <sup>th</sup> Chapter)	Natural Disaster in Bangladesh	Definition of disasters and its classifications. Different types of disasters. Planning for disaster	Natural disaster gets more importance than man-made disaster. Earthquake, drought, <i>tornado</i> , is difficult to understand for a student Class-VI. More on preparedness and immediate response

			mitigation. These chapter can be the middle chapter of the book then it get more importance Importance can be on i) Risk prevention and Risk mitigation ii) Preparedness. iii) Relief and iv) Recovery	can be included to support their family members what s/he needs to do during cyclone and flood can be described. Planning for disaster mitigation it is not so much important for Class VI student.
VI	English Literature	1. Fire-Human Induced Disaster 2. Drought		Unit 5 Help! Fire! Part 1 & 2 Unit eight, Town and Village, No rain (part 1, 2, 3)
VII	General Science	Flood, River, Bank erosion and drought in Bangladesh (24 <sup>th</sup> chapter)	<ul style="list-style-type: none"> <li>• Geographical location of Bangladesh.</li> <li>• Physical features.</li> <li>• Climate of Bangladesh.</li> <li>• Flood (Reason, Devastation, Preparedness and mitigation).</li> <li>• Causes and effected areas, mitigation of drought and river bank erosion.</li> </ul>	<p>Pictorial demonstration is absent for flood, River bank erosion, and drought.</p> <p>A figure can be included why the geographical location of Bangladesh is so vulnerable.</p> <p>Affected areas can be shown by map.</p> <p>Mitigations options of river bank erosion and drought are too short. These could be descriptive.</p>
VIII	General Science	Natural disaster: Cyclone & tidal surge. (25 <sup>th</sup> chapter)	<p>Geographical location.</p> <p>Cyclone (Formation, areas, loss)</p> <p>Tidal surge (Causes, areas, time period, loss)</p> <p>Diseases during disaster period and prevention.</p> <p>Taking measures for prevention (mitigation) cyclone.</p> <p>Warring signals has bee explained.</p>	<p>Too much descriptive. There are different stages of coping with cyclone and tidal surge pre, post, during and long term mitigation measures, points these can be but written in ballet form. That would be easier for students.</p> <p>There is no figure of affected areas. The affected areas can be shown through map.</p> <p>Experiences/information of updated disaster can be included (data and affect).</p> <p>Earthquake vulnerability, school preparedness plan, evacuation can be included.</p> <p>Tornado can be included here.</p>
IX and X	General Science	Disaster management and Bangladesh (21 <sup>st</sup> Chapter)	<p>Objectives of disaster management (focusing on disaster response).</p> <p>The cycle of disaster management.</p> <p>Describe the disaster management structure beginning from National Disaster Management Council (NDMC) down to union Disaster Management committee (DMC)</p>	<p>It can be discussed the pre-disaster preparedness and post disaster relief toward building back better development approach.</p> <p>The DM cycle can be described.</p> <p>Community based volunteer building programme and other groups of people up the community issues can be developed.</p> <p>Students evacuation, search and rescue can be discussed and how to help the other people during and after disaster.</p> <p>And this chapter is the last chapter of the book. X. In this chapter is on the 10<sup>th</sup> chapter then it is read by the students of class IX and X.</p>
IX-X	English	Mother Earth		
XI	Bengali	Disaster Prone earth: Bangladesh and the world.	<ul style="list-style-type: none"> <li>• Different types of Natural and man-made disaster.</li> <li>• Description of man-made peppercress.</li> <li>• Contribution and initiatives of United Nations in disaster management.</li> <li>• Post disaster</li> </ul>	<p>There is no description of contribution that how the student would involve themselves in preparedness and response programme after a disaster.</p> <p>Need to include updated policy programmes.</p> <p>Insertions with regards to HFA, the SAARC disaster management strategy (2006-2015), draft national policy on disaster management roles and responsibilities of DMB, DRR and relevant organizations can be placed in boxes.</p>

			management in our country. Different steps for disaster mitigation.	
XI	Geography (2 <sup>nd</sup> part)	Rivers	Flood control, irrigation	Detail water management plan for agriculture and living with flood can be included
XI	Geography (1 <sup>st</sup> part)	Rivers (3 <sup>rd</sup> chapter)	Flood Causes of flood. Influence of flood. Measures of flood control. Govt. Measures for flood control. Problems of flood control	Detail geographical analysis of the causes of various disasters in Bangladesh, can be included Then discuss the measures taken to mitigate impact of those disaster at pre, during and post disaster phases at all levels, GOB, NGO's and community. In hydrosphere part el-nino, la-nino, cyclone <b>tornado</b> formation can be included Different types of natural disaster occur in the different types of climatic region. This can be hi-lighted (2 <sup>nd</sup> part of climatology). In the chapter of earthquake and volcano it earthquake preparedness can be included
XI	Commercial Geography	Flood control and drainage	Definition of flood, Floods in Bangladesh, Effects of flood, Flood controlling system in Bangladesh. Problems of flood control in Bangladesh, Initiatives taken by the Govt. of Bangladesh, Drainage. Initiatives taken for drainage, Salinity.	Drought, River bank erosion and other natural disaster which have impact on the economy can be included.

### 3. Professional week-Long training course on disaster management

A week-long professional training course on Disaster Management has been developed. The Government of Bangladesh disaster management model, comprehensive disaster management approach is discussed in this training with a view to have general understanding of DM system, management practices in Bangladesh with emphasis on Community based disaster management climate change issues, damage loss and need assessment also covered in the training module.

A total 10 (ten) Training of Trainers (ToT) courses for University teachers, NCTB officials, trainers of NAEM, NARS, BCS Admin Academy, RDA, BPATC and RDA, some of INGO, National NPO officials, disaster managers were conducted at BARD and RDA. A total of 220 persons were trained in the ToTs programme. Besides, a total 20 batches of professional certificate course have been conducted through different partners e.g. DU, JU, KU, PSTU, MBSTU, BAU, CUET, BCS admin Academy, BPATC and AFD. Through this about 300 persons already trained and rest 300 be trained in couple of months. Besides, we have developed the following training modules

- 3.1 Certificate programme in Disaster Management for sustainable rural development (developed jointly with BARD)
- 3.2 Certificate programme in Disaster Management for Armed Forces (developed jointly with AFD)
- 3.3 Certificate programme in Disaster Management for BCS Administration cadre (will developed with BCS Administration Academy)
- 3.4 Certificate programme in Disaster Management for BCS education cadres

#### 3.2 Future partners and area

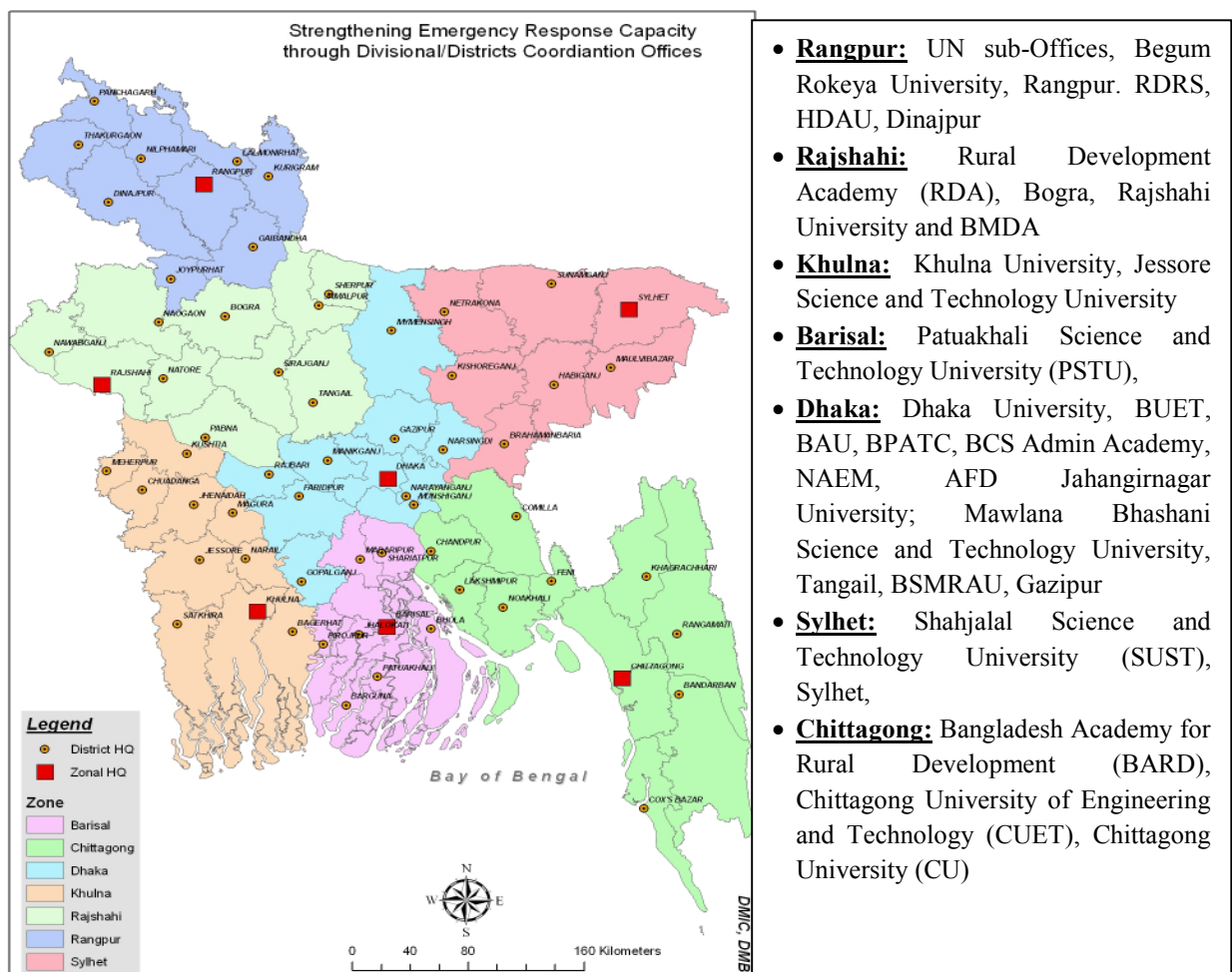
The following are the selected future partners besides some INGO and Local NGOs, strategic partnership will be made to carry forward the activities during the proposed CDMP Phase II besides continuation of the support to existing partners.

- 3.2.1 Bangladesh University of Professionals (BUP), Mirpur Dhaka

- 3.2.2 Bangabandhu Sheikh Mujibur Rahman Agricultural University, Gazipur
- 3.2.3 Begum Rokeya University, Rangpur
- 3.2.4 Haji Danesh Science and Technology University (HDSTU), Dinajpur
- 3.2.5 University of Chittagong, Chittagong
- 3.2.6 Bangladesh University of Engineering and Technology, BUET, Dhaka
- 3.2.7 Jessore Science and Technology University, Jessore
- 3.2.8 National University, Gazipur
- 3.2.9 Jagannath University, Dhaka
- 3.2.10 Bangladesh Ansar Academy, Safipur, Tangail
- 3.2.11 Bangladesh Police Academy, Rajshahi
- 3.2.12 National Institute of Local Government, NILG, Dhaka
- 3.2.13 Imam Training Academy, Dhaka
- 3.2.14 Teachers Training Colleges, National University
- 3.2.15 Youth Training Centres (whole Bangladesh)
- 3.2.16 Academy for Planning and Development, Dhaka
- 3.2.17 National Academy for Primary Education, Dhaka
- 3.2.18 National Institute of Preventive of Social Medicine, Dhaka
- 3.2.19 National Institute of Public Health and Nutrition, Dhaka
- 3.2.20 Barind Multipurpose Development authority (BMDA), Rajshahi

Soon after completion of the partnership and after CDMP phase II, the proposed network map is outlined which is shown in figure 1.

Figure 1. Decentralized disaster management networks



- 3.3 *Post-Graduate Diploma programme in Disaster Management (PGDDM)*  
There are five Diploma course are being pilot tested in the department of Sociology, ISWR of DU, Department of ESDM of PSTU, in two disciplines (ESD and BGE) in KU. The five courses will give major five flavors on disaster management emphasis on technology, agriculture, environmental management, sociology and social work.
- 3.4 *Masters in Disaster Management*  
BRAC University has introduced post graduate Programme on Disaster Management since 2005 and Under CDMP-KU partnership and CDMP-CVDS, DU, Masters in disaster management curriculum are being developed and introduced.
- 3.5 *Bachelor of Science in Disaster Management*  
Under CDMP-PSTU partnership this undergraduate programme in disaster management has been developed and introduced through University Grants Commission. Detail programme and curriculum can be found in [www.pstu.edu.bd](http://www.pstu.edu.bd).
- 3.6 *Compulsory subject/course for relevant degree programme*  
A course (3 credit hours) named 'Introduction to disaster management' has been developed and pilot tested in MBSTU, which can be introduced in undergraduate programme B. Sc. Agricultural Sciences, Engineering and Business degree programme.
- 3.7 *Research on disaster management and CC issues*  
Under the CDMP professionalizing development programme, this year (2009) about 70 students (Graduate intern, MS/MSc) were selected through Universities for their thesis/terms paper/graduate projects on disaster management issues identified by concerned expert group. In most cases professional from CDMP supervised jointly with the University supervising team. 10 Thesis have already published/submitted to concerned department and rest of them will be submitted in couple of months.
- 3.8 *Importance of disaster management expertise in Bangladesh*  
The nature and frequency of natural and human induced disasters especially large-scale catastrophic events have been increasing these days. Climate change (CC) impact has also triggered these events. In order to prepare the nation of about 160 million people, Bangladesh requires professionals with the background and education in dealing with natural and man-made hazards. The undergraduate degree programme in Bachelor of Science (Hons.) in Disaster Management (BSc. Hons in DM) prepares students for careers in disaster and emergency management and public safety careers. From the smallest incident to the largest catastrophe, our emergency and disaster management stresses the fact that "all disasters are local", which is a foundational emergency management concept. In addition, we under this programme our students will be introduced all-hazards approach, all sectors and all phases of disaster management, risk assessment, risk reduction, prevention and emergency prepared, relief, recovery, reconstruction and development. Disaster Management personnel are invaluable when disaster strikes. They are trained to manage emergency situations and respond to the needs of the people and areas affected in a quick and efficient manner. They may responsible for evacuating a town in danger, managing the distribution of food to people in crisis, or overseeing the provision of medical care to injured people. They are needed in large and small emergencies, including hurricanes, terrorist attacks and chemical spills. This is to create a new disaster management cadre (Challenging times, editorial 2008), which need complete professional with basic degree on disaster management.

### 3.9 *DM education and career opportunities*

International careers in disaster management are usually government jobs, jobs with emergency services, law enforcement, local authorities, relief agencies, non-governmental and non-profit organizations and international agencies such as the United Nations, etc. Private sector careers are also available while fulfilling their corporate social responsibilities. Systems or network administrators, database analysts or administrators, security administration or operations analysts are positions to participate in an organization's disaster recovery planning and management in the sphere of information technology. Social workers, engineers, medical/health experts, environmental experts, rehabilitation workers, scientist etc. could also have careers in disaster management, disaster mitigation and rehabilitation. Careers in Bangladesh is in local and national level, Ministry of Food and Disaster Management, Ministry of Environment and Forest, Upazila level disaster management offices, Bangladesh office of the International agencies like UNDP, FAO, WFP, UNHCR, UNICEF, International Red Cross Society, CARE, Save the Children, Oxfam, Action Aid, BRAC and many other non-profitable disaster and humanitarian organizations.

### 3.10 *Tornado in education materials in Bangladesh*

The hazard tornado has been placed in many part of the elementary and secondary education materials, besides, the description of tornado hazard and disaster and preparedness for tornado has been discussed in the new "public preparedness for disasters" on *Ghurnijha o Abohawar notun satarka Sanket abong gono Durjug Barta*"- New Warning signals for Cyclone and Weather and Disaster News-published by Disaster Management Bureau. The issue tornado also placed in National Disaster Management Plan and other education and research issues.

### 3.11 *Conclusion*

Strengthening and networking with wide range of National academic and training institutes for disaster management has been made. Enhancement of the capacity of partners in terms of infrastructure, training, curriculum, syllabus, resource material development and procurement, education and research support are inevitable in order to have ensured sustainability of the programme and building linkages with competent authorities for employment of the professionals. Besides networking from international similar organizations are essentials.

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