COMMUNITY BASED DISASTER MANAGEMENT STRATEGY IN BANGLADESH: PRESENT STATUS, FUTURE PROSPECTS AND CHALLENGES

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ABSTRACT

Community participation is the most effective elements to achieving sustainability in dealing with natural disaster risks. As a disaster prone country Bangladesh is affected by different types of natural hazards like tropical cyclones, tidal bores, floods, tornados, river bank erosions, earthquakes etc. almost every year and destroy many lives and resources of people. It is surrounded by thousands of rivers, in the North the Himalayan range and in the South the Bay of Bengal creates harsh weather especially for a large number of poor people live in the southern part of Bangladesh making them as common victim of natural calamities, sometimes the vulnerability is so miserable that they must resettle themselves in the newly accreted land. For sustainable development, the negative impacts of these natural hazards must be minimized that affecting the socio-economic condition. The prevention of occurrence of natural disasters influenced by natural causes may be impossible but it can be reduced by proper planning, management and human collective participation. From realization of this reality, the government of Bangladesh has adopted disaster management plans and programs for the mitigation of disaster and its possible adverse impacts. This study analyzes the approaches to disaster management by grassroots community participation in Bangladesh based on literature review.

Keywords: Disaster management, Sustainable development, Natural disaster, Community participation, Mitigation.

INTRODUCTION

Bangladesh is a developing country in South Asia which has above sixteen core population (www.bbs.gov.bd). Its geo-physical location makes it prone to various disasters like floods, cyclones, earthquakes, etc. which cause great losses of lives and damage to properties, livelihoods and economic infrastructure (Zimmermann et al. 2012) and human-induced climate change exacerbates the problem, with its already manifested effects and the predicted rise in sea level of 0.3 m to 0.5 m by 2050 (Agrawala et al.2003; GBNAPA, 2005; Loucks et al. 2010). As a result, the country facing at least one major disaster a year; it has lost on average 3.02 % of its GDP every year during the last 10 years and holds the highest disaster mortality rate in the world (UNDP, 2004). In the period of 1970–2004, about 0.7 million people lost their lives due to natural disasters, and economic losses total about US $5.5 billion (Chowdhury & Rahman, 2001; Haque, 2003; CRED, 2004; FFWC, 2005). Disaster management has undergone significant changes in recent decades in the developing world, particularly in terms of reduction in the loss of human lives as a consequence climate change not only affecting individual countries but also other countries in the world ultimately Bangladesh as a part of South Asia experiencing extreme weather (Haque and Uddin, 2013). In 1970, in the coastal areas of East Pakistan, cyclone claimed over half a million lives and in the period of 1991 and 2007 it caused the loss of about 149,000 and 3,406 people respectively. 12 November 1970 cyclone took a tool of 0.3 million human lives in Bangladesh and damaged more than one billion US dollars with enormous property (Carter,

1991), moreover another worst cyclone which hit Bangladesh coast on April 1991 killed 0.14 million people and damaged property which worth more than two billion US dollars. The cyclone of 1876, 1919, 1961, 1963, 1965, 1985 and 1988 were also of severe nature (Nawaz and Shah, 2011).

In 1988, terrible flood inundated 89,000 sq. km. areas of 52 districts of the country and caused loss of 1517 human lives and in the time of 1998 flood inundated 53 districts covering about 100,000 sq. km. areas and it took lives of 918 people that last for 65 days. The severe floods of 1922, 1954, 1955, 1974, 1984 and 1987 were also mentionable. In recent time, the increasing frequency of destructive floods causes economic loss and in history the most devastating flood occurred in July 2004 with an economic loss of about US $2.2 billion (ADB and World Bank, 2004). In terms of GDP, this loss was less than what the world's poorest countries faced during the 1985–99 disasters – a loss of 13.4% of combined GDP (ISDR, 2004). But the loss in Bangladesh amounted to an immense step backwards in development efforts. The floods in 2007 inundated about 36% of the total area in 57 out of 64 districts (CEGIS, 2007) and affected at least 4.5 million people (OSAF, 2007). Tornadoes of 14 April, 1969, 11 April, 1974, 01 April, 1977 and 26 April, 1989 caused localized devastation, both in terms of lives and properties. Because of the extreme vulnerability of the people various regimes of the government of Bangladesh have developed an institutional infrastructure to deal with natural hazards and their potential losses (GOB, 1997; GOB, 2004). Traditionally, the disaster management approach in the country has been failed to effectively deal with the problems of disaster loss. In present time, non-structural measures as well as pre-disaster mitigation and preparedness are initiatives that recognize the roles of different stakeholders (government, local communities, NGO/ CBOs, media, the private sector, academia, neighboring countries, and donor communities). For example, the Disaster Management Act of 1998 acknowledges the capacity of affected populations (GOB, 1998). The GOB constructed 2500 cyclone shelters (https://en.m.wikipedia.org/wiki/) and 200 flood shelters and 482 small, medium and large water and flood control projects (Dewan, 2015) but only 99 flood shelters are active (IFRC, 2014) for evacuation of people exposed to impending cyclone as well as floods.

The extent and effectiveness of community participation from the perspective of a shift from a managerial approach to an approach using participatory, collective decision-making and resource-sharing to manage disaster risk. There are very limited research about the disaster management to attain sustainable development via community participation and further analysis needed in near future. This study is undertaken to find out the necessity of community based disaster management, its barrier and its possible solution for the betterment of the affected people in the vicinity of disaster prone areas.

Methodology

Relevant secondary data and information from various official sources collected to support the study such as project documents, annual reports, official statistics, official regulation documents, grey literature and journal articles.

CONCEPTUAL FRAMEWORK

Disaster

Disaster is a sudden, calamitous (www.ifrc.org/.../disasters/what-i), distressing, or ruinous effects of a disastrous event (such as drought, flood, fire, hurricane, war etc.)

[www.businessdictionary.com/…/disaster…] that cause serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources (https://en.m.wikipedia.org/wiki/Disaster).

Disaster management

Disaster management is a process of getting prepared to improve the impacts and to mitigate the risk of disaster involving emergency operation and rebuilding the society after the occurrence of devastating disaster (Tan, 2009). It is associated with various factors and it is obvious for us to have good understanding about the disaster. According to Ariyabandu (2003) describes the concept in the following manner:

> "*Hazard is defined as the probability of the occurrence of a dangerous phenomenon at a given place within a given period of time. … On the other hand, vulnerability is defined as the degree of susceptibility to a hazard, or the lack of capacity to absorb the impact of a hazard and recover from it.*"

Hazard is always not disaster but when the structural and non-structural infrastructures of affected area are too dilapidated to cope with these risks then hazard turn into disasters. Basically, hazard like flood, cyclone, drought, tidal wave etc. are meteorological risk (Bhatti, 2003) but according to UNDP (2007) this type of hazard get the shape of disaster when vulnerable populations do not have the capability to combat it and who are unable to cope with it.

Community-Based Disaster Management (CBDM)

The government alone cannot and will not be able to properly manage and handle all types of disasters with its machinery without active participation by the people of any country, a common theory given by policy makers, experts and professionals. Failures of top-down effective disaster management approach to reduce the risk of disaster are the evident of that notion. As a consequence, numerous scholars and stakeholders feel that it is high time to adopt a new strategy that will involve vulnerable people directly in the planning and implementation of mitigation, preparedness, response, and recovery measures because communities are the best judges of their own vulnerability and capable of making the best decisions regarding their well-being. This philosophy, involves local level people, leaders and community to provide necessary services and logistics to their victims during and after disaster has been encouraged both in the developed and developing countries and launched the generation of Community-Based Disaster Management (CBDM) strategy.

Emergency response

Emergency response includes the fundamental services and activities that are undertaken during the initial impact or in the aftermath of a disaster including those to save lives and to prevent further damage to properties (Bhatti, 2003; Kreps and Gary, 2006; Kapucu, 2008).

Vulnerability

Vulnerability refers to a set of prevailing and consequential conditions that adversely affect the ability of a person, group or community to prevent, mitigate, prepare for and respond to hazardous events and recover from impact of natural hazards (Bhatti, 2003; O'Brien et al.,

2006) which is related not only to physical factors, but also to a range of social, economic, cultural and political factors (Ariyabandu, 2003).

Preparedness

Preparedness is a broad term that covers the activities designed in foresight of a disaster to ensure that appropriate and effective action is taken earlier to cope with the disaster and to abate the loss of lives and properties. These measures include the disaster plans, the training of responders, the maintenance of human, material and financial resources and the establishment of public education and information system (Kreps and Gary, 2006).

Prevention

There is an old adage that "prevention is better than cure" that includes the measures taken to impede the occurrence of a disaster. Notwithstanding, it is not possible to prevent the occurrence of natural disasters fully but the extent of its damages can be reduced (Ahmed, 1994).

Recovery

Getting back of something that has been lost during the occurrence of any odd situation is called recovery (Hornby, 2000) but in disaster management it refers to the activities that are taken after the initial impact to develop socio-economic and environmental conditions that are demolished by disaster for achieving normality (Kapucu, 2008), that is, disaster recovery activities are related to the reestablishment of pre-disaster social and economic routine provision of financial and other services to the victims and to repair of destroyed properties (Kreps and Gary, 2006).

Mitigation

Minimization of the destructive effects of hazards and lessening the magnitude of disaster through some meaningful activities that can occur before, during and aftermath of disaster and overlap of all phases of disaster management is called mitigation (Fernando, 2001).
In brief flood, cyclone, drought, tidal surge, tornado, cold wave, river erosion, arsenic contamination of ground water are acquiesced as disaster when it turns into hazardous event and affects a certain territory and the affected people of that area who are not able to cope with it. On the contrary, disaster management is considered as an approach that combines prevention, preparedness, mitigation, emergency response and recovery to cope with hazardous situation created by above-mentioned natural hazards.

Major Disasters and their consequences in Bangladesh

Bangladesh is a low-lying deltaic country in South Asia formed by the Ganges, the Brahmaputra and the Meghna rivers system (DMB, 2010) with long coastline, is highly exposed to different types of natural disasters (Hossain, 2012) which have negative impacts on 136.7 million (SVRS, 2004, BBS) people within its 147,570 sq. km (Agriculture Statistics WinWing, BBS 2004-2005) territory. The country has experienced 200 natural disasters causing loss of more than 600,000 lives, millions of livestock and leaving prolonged damage to property, quality of life and livelihoods since the independence in 1971 (MoFA, 2006).

Table 1: Different Types of Natural Disasters Occurred in Bangladesh

Year	Types of Disaster	Number of Deaths
1965	Cyclone	19279
1965	Cyclone	873
1966	Cyclone	850
1970	Cyclone	300000
1985	Cyclone	11,069
1987	Flood	1,657
1988	Cyclone and	7,457
1991	Flood	1 , 38,868
1997	Cyclone	550
1998	Cyclone	1050
2000	Flood	36
2004	Flood	800
2007	Flood	554
2007	Flood	3406
2009	Cyclone	503
	Cyclone	

Source: Bangladesh Meteorological Department 2007

Table 2: Overall summary of damage & Losses by Cyclone Sidr 2007 in Bangladesh

Sector	**Subsector**	**Disaster Effects (BDT Million)**			**Disaster Effects (US$ Million)**		
		Damage	**Losses**	**Total**	**Damage**	**Losses**	**Total**
Infrastructure		**71064**	**2130**	**73194**	**1029.9**	**30.90**	**1060.8**
	Housing	57915	--	57915	839.3	--	839.3
	Transport	8006	1725	9731	116.0	25.00	141.0
	Electricity	576.0	359.0	935.0	8.300	5.200	13.60
	Water and Sanitation	157.0	46.00	203.0	2.300	0.700	2.900
	Urban and Municipal	1696	--	1696	24.60	--	24.60
	Water Resource Control	4918	--	4918	71.30	--	71.30
Social Sectors		**4482**	**1453**	**5934**	**65.00**	**21.00**	**86.00**
	Health and Nutrition	169.0	1038	1206	2.500	15.00	17.50
	Education	4313	415.0	4728	62.50	6.000	68.50
Productive Sectors		**1734**	**32083**	**33817**	**25.10**	**465.0**	**490.1**
	Agriculture	1472	28725	30197	21.30	416.3	437.6
	Industry	262.0	2035	2297	3.800	29.50	33.30
	Commerce	--	1258	1258	--	18.20	18.20
	Tourism	--	65.00	65.00	--	0.900	0.900
Cross-Cutting Issues		**420.0**	**0.000**	**420.0**	**6.100**	**0.000**	**6.100**
	Environment	420.0	--	420.0	6.100	--	6.100
Total		**79904**	**35665**	**115569**	**1158**	**516.9**	**1674.9**

Source: Estimates by JDNLA Team.

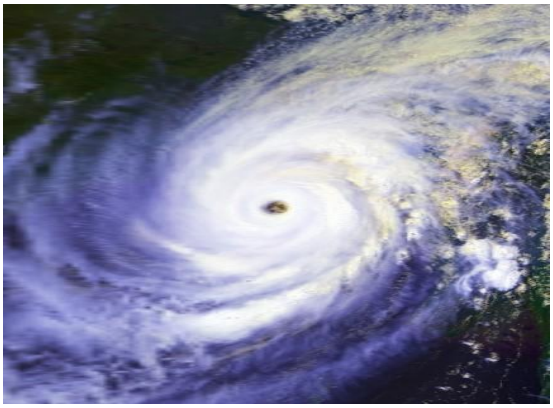
Figure 1: Cyclone BOB-01(29 April 1991)

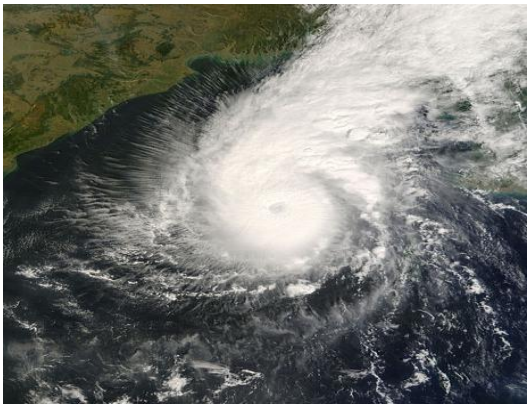
Figure-2: Cyclone Sidr (15 November 2007)

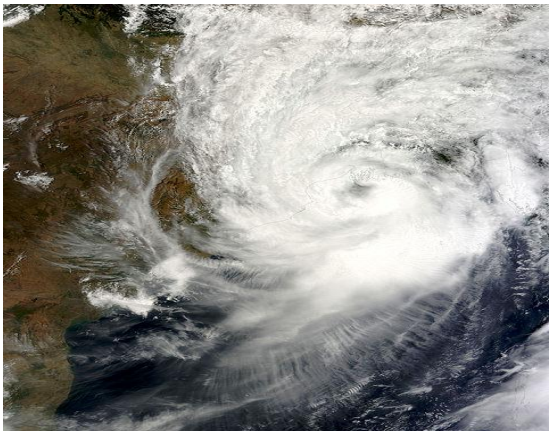
Figure-3: Cyclone Aila (27 May 2009)

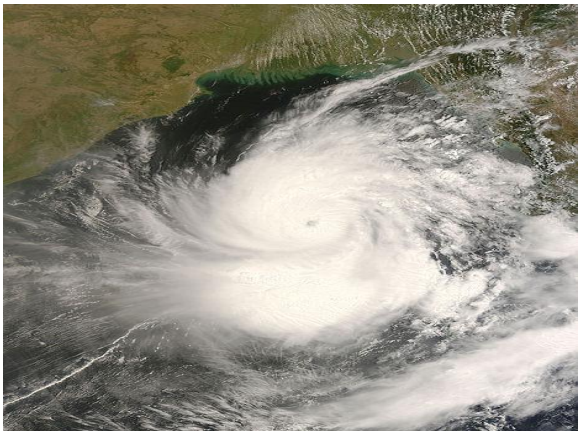
Figure 4: Cyclone Nargis(27 April 2008)

Table: List of major Earthquakes in Bangladesh

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

Source: Choudhury, 2005

National Plan for Disaster Management 2010-15

According to the National Plan for Disaster Management 2010-15, the vision of the government 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. The Plan envisages a group of broad-based strategies:

1. Disaster management would involve the management of both risks and consequences of disasters that would include prevention emergency response and post-disaster recovery.
2. Community involvement for preparedness program for protecting lives and properties would be a major focus. Involvement of local government bodies would be an essential part of the strategy. Self-reliance should be the key for preparedness, response and recovery
3. Non-structural mitigation measures such as community disaster preparedness training
   advocacy and public awareness must be given a high priority; this would require an integration of structural mitigation with non-structural measures.

The scope of the Plan includes

a. Analyze the natural and man-made disaster threats including climate change to their people and society, economy and infrastructure, with a view to identifying where and when these threats are likely to occur and in what frequency.
b. Identify by further detailed analysis who and what are vulnerable to the occurrence of these threats and how these are likely to be affected by them.
c. Investigate what measures are possible to prevent occurrence of the disaster events, (unlikely to be possible in the case of the natural phenomenon but possible in the case of man-made disasters and environmental degradation), what can be done to mitigate the affects of disaster events and what disaster preparedness measures can be put in place in anticipation of these.
d. Determine where responsibilities for prevention, mitigation and preparedness planning and action should lie in the Government, non-government organizations (NGOs) and the private sector.
e. Make provision in the national budget for funding of activities related to Disaster Reduction and a contingency fund to meet the immediate needs of disaster relief, at all administrative levels of the administration.
f. Ensure that the costs of disaster relief and post-disaster recovery are managed and coordinated by a high level committee to avoid duplication or waste across the spectrum of donor agencies, including government, national and international NGOs and the private sector.
g. Ensure an effective system within Government to link and coordinate the processes of planning and the management of sustainable development, environmental management and disaster reduction.

Disaster Management Practices in Bangladesh Perspective

Disaster management in independent Bangladesh has undergone a complex process of development that's why it develop a workable system of disaster management as Bangladesh is one of the worst victim of natural disasters (Sabur, 2012). In Bangladesh disaster management program is the combination of both the development of physical infrastructure and non-structural practices (Asian Disaster Reduction Center n.d.:68-69). Building of cyclone and flood shelters for emergency resort, and construction of flood protection embankments, sluice gates, drainage channel, and regulators as safety measures against inundation by tidal waves, storm-surges and flooding, and establishment of emergency operation center mean development of physical infrastructure. On the other hand, in the non-structural practices preparedness action and strategies, and coordination among the actors are mainly involved (GoB, voluntary agencies, civil society, and affected community). It is a process of adoption associated with national disaster management policy, disaster management legislation, arrangement of training program and workshop disaster management plan;, and introduction of institutional framework of disaster management with the establishment of Disaster Management Bureau, establishment of councils and committees at the national, district, upazila and union levels (Hossain, 2012).

Construction of cyclone and flood shelters, erection of flood protection embankments, adoption of disaster management plan, development of institutional framework, development of strong, simple and understandable warning system that is linked to local, regional and national information system, awareness raising campaign, training program in disaster preparedness, community first aid, and cyclone shelter maintenance, installation of drinking water, food storage facilities and social safety net program are the initiatives taken by GoB to reduce disaster intensity (MoFDM, 2007).

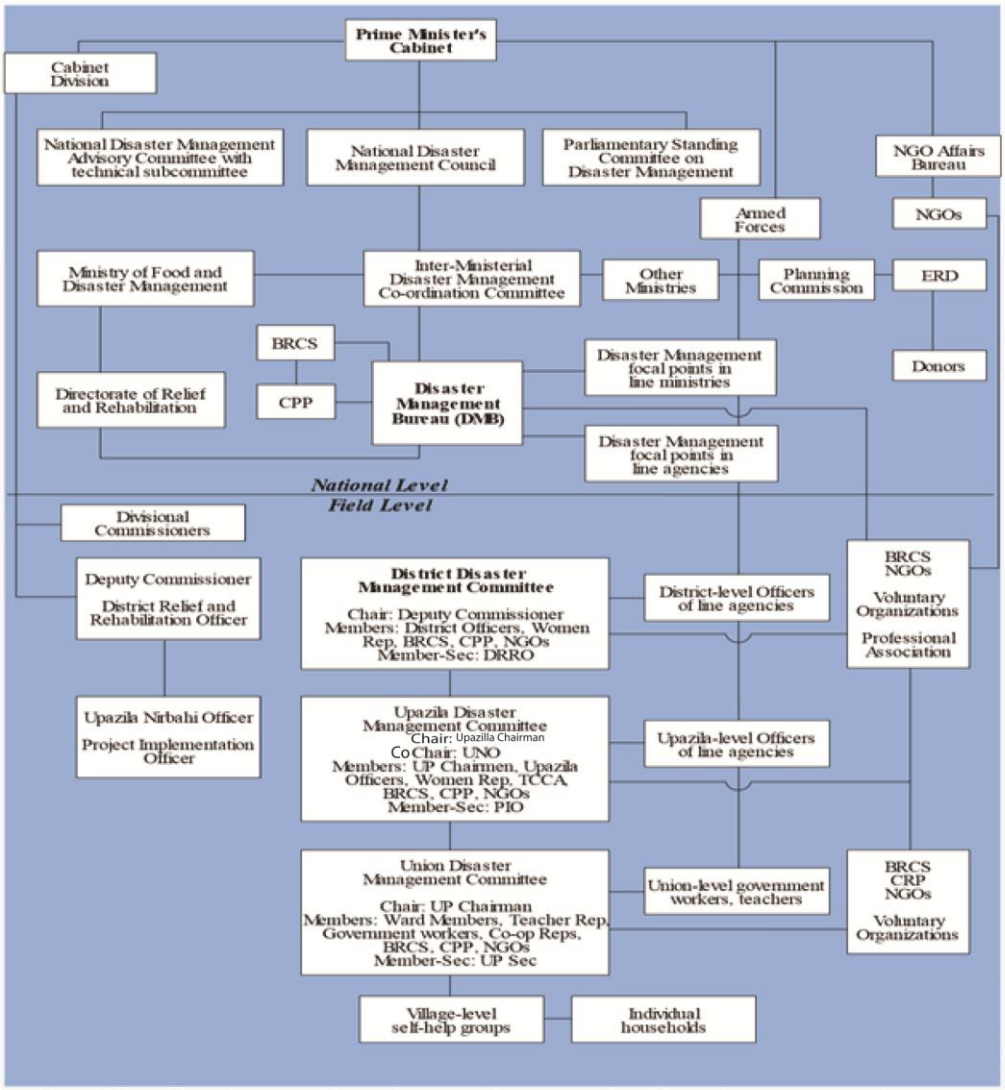

Figure 5. Organizational structure and institutional arrangements for disaster management at the national level and field level

(Source: Haque and Uddin, 2013)

Aim of Community-Based Disaster Management in Bangladesh

The main vision of CBDM is to alleviate vulnerabilities and to strengthen people's capacity to deal with hazards and cope with disasters. The community will able to address the problems related to disaster and mitigation measures in the existing system for disaster management in the country that covers activities at normal times for important disaster management aspects like mitigation/prevention, preparedness, response and recovery. Development program and participation from the community in planning and executing the programs will improve the local capacity and preparedness measures (Cuny, 1983).

Considerations for implementation of CBDM

According to Yodmani (2001) the consideration are:

1. The focus must be on the local community in case of disaster management as the local
community has a central role in long-term and short-term disaster management.

2. To reduce Disaster risk or vulnerability CBDM must increase a community's capacities and their resources, and by improving and strengthening coping strategies.
3. CBDM should establish linkages to the development process and improve the quality of life of the vast majority of the poor people and of the natural environment.
4. CBDM contributes to people's empowerment which affects their lives; to enjoy the benefits of a healthy environment.
5. As community is a key resource in disaster risk reduction, their role and interests must be recognized.
6. A multi-sectoral and multi-disciplinary and trans-disciplinary approach must be applied.
7. The CBDM is an involving and dynamic framework so its implementation must be monitored, evaluated and adapted to incorporate newer elements.

Stumbling blocks in Community Participation

From the study it is proved that without simultaneous participation of community it is very painstaking to cope with natural disaster but traditional thinking of community, bureaucratic attitude of government officials, scarcity of resources and prevalent socio-cultural norms and values made it extremely gigantic task (Ahmed, 1994; Rahman, 2008). The major hindrances that pave the way of community participation in disaster management are outlined below:

a. Primitive notion that distribution of relief materials among the victims is the solely responsibility of government and/or voluntary agencies during the period of disaster. But this culture must be eradicated from the society (Rahman, 2008).
b. The associated administrators are not willing to accept the opinion of illiterate but wise and experienced local people in policy cycle (Ahmed, 1994).
c. Financial assistance is fundamental component of disaster management though Bangladesh approved annual allocation of US$ 12 million but this amount is not adequate (Rahman, 2008). Moreover, the national and local voluntary agencies have lack of adequate financial resources to operate community-based program due to scarcity of resources (Miskel, 1996).
d. Absence of common forum, lack of co-ordination, confusion of jurisdiction of work, lack of mutual trust and respect etc are constraints of community participation ((Nawaz and Shah, 2011).

Women do not want to leave their residence and take shelter in the public buildings during disaster system of social arrangement is the institution of *purdah* or female seclusion. Practice of *purdah* inhibits the mobility of women (Kabeer, 2000) and limitation of sanitation facilities for women in public buildings is another barrier (Nahar, 2001). That are the great barrier to women participation in disaster management.

Community coping strategy to disaster

To face the various disasters community undertake multi steps to cope with the severity of disaster individually. The Disaster Management Bureau set up first milestone by conducting research on the issue and implementing the objectives to reduce disaster risk and loss. Moreover, DMB organized six workshops for community leaders on disaster preparedness and indigenous knowledge on coping mechanism in the year of 2003.

1. **Creation of public awareness**

This tool is very important in disaster management because there are some superstitions about women participation that can be eradicated by creating awareness among the people. Pulong-Pulong sa barangay (barangay meetings) was started in June 2000 to empower the people. The municipal government has planned to set up a community radio station to empower the people through information dissemination and informative/educational programs (Nawaz and Shah, 2011). Programs on farming techniques and new technologies, health care, livelihood, and an interactive program that would serve as a platform for community-local government dialogue and financial assistance has been sought from and committed by Congressman Monfort (Haider, 1991).

2. Proper utilization of climate information

Information on climate is very essential for preparedness and reducing disaster related losses. Timely weather forecasting is the urgent need as a consequence community radio station was established to broadcast time-relevant and accurate information and advisories during emergencies and technical support is provided by the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA). Community-based flood forecasting and warning in collaboration with PAGASA help in identifying risks and measures to reduce these risks.

3. Appropriate prevention and mitigation measures

The allocation of National government resources to LGUs is determined by a formula that effectively aims to improve the quality of life in the least densely populated areas awarding 50% of the resources according to population size, 25% by land area and 25% divided equally between all (local governments of the same categories (World Bank, 1995b). However, the World Bank argues that 'the amounts transferred bear no necessary relationship to the actual cost implications of devolved functions. Nor do they take into account the capacity of local governments is to raise their own resources or to carry out devolved functions' (World Bank, 1995a). Varying levels of funding are actually drawn down depending on the incidence of disasters in a particular year (Rahman, 1991) because different LGUs face varying expenditure demands with regard to natural disasters at particular points in time, depending both on their vulnerability to disasters and LGUs feel obliged to use such funding in full cost-recovery projects, a practice which could discriminate against investment in disaster prevention and mitigation projects (Walker, 1994). Furthermore, land can be exempted from land taxes which accrue to LGUs if natural disasters legally or physically prevent improvement, use or cultivation of that land (Kafiluddin, 1991).

4. Showing Mutual respect

In order to ensure co-ordination, proper management overall well-being of affected people all civil agencies and military administration must have respect for each other.

5. Timely communication

For achieving the desired fruit or goal, proper and timely communication between civil and military administration is a much needed tool.

6. Regular basis Specialized Training

Training helps to make out the mitigation measures and annual preparedness among the affected people even though most of them are illiterate.

CONCLUSION AND RECOMMENDATIONS

Disaster management in Bangladesh is an important phenomenon for the sustainable and meaningful development as Bangladesh is a natural disaster prone country by its geographical location. Government alone cannot cope with the disaster for this need community participation with their opinion and ensuring participation in every stage of policy cycle, emerged on the backdrop of dominant approach though it is very difficult to predict the impending danger and the socio-economic conditions and the logistic support facilities. But there are some problems related to community participation which must be solved by social workers as they have extended networks in communities, they are familiar with community resources and potentiality of local leaders and are equipped with necessary knowledge for addressing complex situation resulting in emergency at local and national levels (Mathbor, 2007). Because of climate change more trained as well as devoted social worker need for post disaster situation. Moreover the government has to allocate more funds in disaster management sector, government officials have to give-up bureaucratic attitude and have to be more people friendly to make CBDM program a success (Hossain, 2012). Nonstructural measures should be enhanced (Mirsa and Mathur, 1993) for flood management. Weather forecasting and warning system should be adequately planned and timely done. For this need expert and trained personnel which can be generated by training on regular basis. Seminars, consultations and public discussions are necessary tools for providing education and counseling services. Giving emphasis on building more strong infrastructures for shelter during disaster. At the end, it is urgent to bring disaster prone areas under feasible communication system for the reduction of disaster period losses.

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