



Status of cyclone shelter facilities in south central Bangladesh

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Abstract

The south central region of Bangladesh is vulnerable to devastating cyclone. One of the most recognizable strategies to reduce risk of cyclone is cyclone shelter (CS). This study focuses on peoples perception on the status of cyclone shelter facilities in terms of its feasibility, water supply-sanitation facility and people's expectation about overall environmental conditions etc. To review the perceived status of CS in south central region, a face to face questionnaire survey was conducted. Besides some key informants interview was also performed to validate the collected data by interview. The results revealed that the facilities of the CS were not satisfactory according to the most of the respondents. Among the respondents about 60% are highly vulnerable to cyclone. However, about 56% people were not interested to go CS during the disaster warning period because of the absence of connecting road. Another important issue that people indicated for going to CS was women security. More than 50% of the respondent perceived about unhealthy sanitation facilities. Safe drinking water, men and women separate bathroom perceived to be the important considerable factors among the CS facilities in the study area.

Key words: Cyclone shelter, Perception, South central region, Vulnerable group

Introduction

Bangladesh is one of the most natural disaster prone countries of the world. Over the last 40 years many cyclones had affected the country accompanied with loss of lives and property. Global climate change will make the country even more vulnerable to cyclones (Ahmed, 2008). Cyclones and induced surges are considered the world's foremost natural hazard that even surpasses the earthquake (Murty and El-Sabh, 1992; Finkl, 1994; Dube *et al.* 1997; Zerger *et al.* 2002; Benavente *et al.*, 2006). For low-lying countries as Bangladesh it is very important to adapt to climate change, to reduce impacts which may lead to increased human misery, basically loss of human life (Ahmed, 2008).

The Geographical setting of Bangladesh makes the country vulnerable to natural disasters (MoEF, 2008). During the last 100 years, Bangladesh has experienced 53 major cyclones. In the November 1970 Bangladesh experienced the greatest tropical cyclone disaster with a 10 m high storm surge which killed up to 500,000 people. Almost 140,000 people died and about 11 million people were affected as a result of the cyclone in April 1991 (IFRC, 2002). SIDR devastatingly attack the southern part of the country in 15 Nov 2007 with a wind speed of 270km¹h and make about 3500 people died as well as huge property loss (MoFDM, 2008). These indicate that Bangladesh is prone to frequent destructive tropical cyclones associated with storm surge, particularly in pre-monsoon months of April-May and post-monsoon months of October-November. There are many cyclone shelters (CS) in the coastal areas of the country, but the difference between actual need and existing shelter number is quite small. Beside its internal facilities and condition were lower in the past years than present year (Ahmed, 2008). It is true that there is great lacking of cyclone shelter but another considerable cause of people unwillingness to go CS were its usable facilities. Internal conditions of CS such

as sanitation, water supply, medical treatment were not good or satisfactory (Tamima, 2009; Ahmed *et al.*, 2009). The past records show that most of the cyclone that passed through Bangladesh hit south central districts. Among those Dashmina, Patuakhali is the one of the most vulnerable to cyclone hazard. The number of causality of this area was very high during the last couple of cyclones. The number of cyclone shelter is less than the actual need in this area (Shey, 2012). As a result the urgent construction of more CS in this area is one of the prerequisite. Moreover, the facilities of those CS also need to be improved that encourage more people to come during disaster situation.

This study focused on the people's perceptions on the cyclone shelter facilities in the south central coastal region. The main aim of this study was to the review perceived physical facilities of cyclone shelters, sanitation and water supply conditions in CSs and to suggest perceived improvement options for CSs.

Materials and Methods

Study area

The study was conducted in Dashmina upazila in Patuakhali District in the central coastal area of Bangladesh (Fig. 1). Studied upazila was selected on the basis of cyclone induced vulnerability that was experienced from previous history. Dashmina has 6 unions (smallest administrative unit of Bangladesh), 51 mauzas/mahallas, and 55 villages. It is situated on the Bank of the river Tetulia. Dasmina is located at 22°17'00"N 90°35'25"E to 22.2833°N 90.5903°E. It has a total area 351.88 square km². Currently estimated house hold (HHs) number is 22009 and the total population is 117054 (BBS, 2011).

Data collection

First of all the study concentrates on to review the current facilities of cyclone shelters. In this case connecting road, cyclone shelter location, facility for

women, sanitation and water supply facilities and medication facilities was considered.

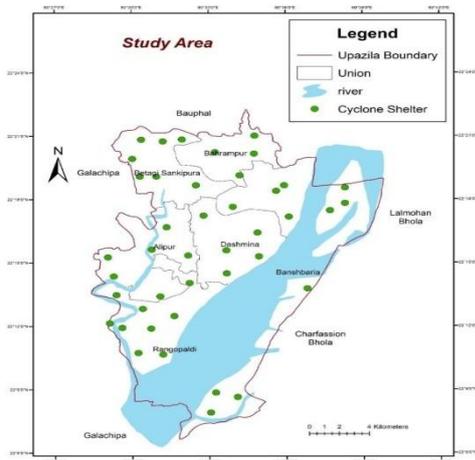


Fig. 1. The study area of Dasmina Upazila in Patuakhali, Bangladesh Cyclone prone area of Bangladesh

As the main road of this study was people’s perception, therefore, most of the issues were taken from direct answering. In the last part of the study people’s expectations for betterment of the cyclone shelter

facilities was asked. For building more user friendly cyclone shelter different types of facilities were offered to choose by the respondents.

For the fiscal constrains 75 house hold (HH) face to face questionnaire interviews were conducted. The collected information through face to face questionnaire interviews data were validated by introducing some Key Informants Interviews (KII). In both case results of the perceptions were similar. Samples were drawn proportionately by using simple random sampling from different unions (smallest administrative unit of Bangladesh) of the study area. Data was collected from the month February to May 2015.

Data analysis

At first social supremacy index of the respondent was constructed using the collected data to analyze the supremacy and vulnerability according to different indicators like monthly income, education and category of house etc. Social supreme index indicator is a scale which indicates people’s socio-economic level thus level of vulnerability to cyclone.

Table 1. Social supreme index indicator (Mallik, 2011)

Table 1(a)				
Sl. No.	Indicators	Category (in BDT)	Weight value	Explanation of the weight
1.	Monthly income	<4500	1	2USD (145 BDT) is indicator of poverty by WB
		4500-12000	2	
		13000-25000	3	
		>25000	4	
2.	Education	Illiterate	1	
		>Class five	2	
		>SSC	3	
		>HSC	4	
		HSC	5	
		Graduate	6	
3.	Category of house	Kutcha	1	
		Semi pucca	2	
		Pucca	3	
Table 1(b):				
Level of respondents			Given score according to table 1(a)	
Mostly vulnerable to cyclone concern about to cyclone			3-7	
Social supreme (elite society)			8-10	
			>10	

In this index it incorporates respondent’s income level which is categorized on the basis of poverty indicator narrated from World Bank (2 USD/day). It has been divided into 4 scales. In this study ranking was made according to descending order (Table 1a and 1b). Table 1a and b shows the social supreme index indicator on the basis of Mallik (2011). The cases of education were divided into 6 levels where, rank ‘1’ is for illiterate ‘6’ is for Graduate. All types of houses were recognized as

“kutcha”, “Semi Pucca” and “Pucca”. Here, weighted value was confirmed based on the construction materials (see Table 1a). After giving weight to all of the parameters, a respondent level by defining some weighted value range such as mostly vulnerable to cyclone (3-7), concern about to cyclone (8-10) and social supreme (elite society) (> 10) was calculated (Mallik, 2011).

Through the literature review and face to face questionnaire interviews the perceived status of cyclone shelter facilities were explored. Collected data was analyzed to determine the people’s perception on the CS facilities of the studied area. Different literatures were sorted to confirm the perceived CS facilities. In the last part of the study, respondent’s suggestions were introduced and ranked to analyze the need of the people’s participations in CS facility improvements decision making process.

Results and Discussion

Social vulnerability indicators of the respondents

Social supreme index indicator determines the vulnerability status of the respondents. According to the weight given in Table 1a and b about 60% of the selected respondents were highly vulnerable to cyclone, about 30% of the respondent were concern about cyclone and 12% of the were in the supreme group (Fig.2). This distribution of the respondents proves the representativeness of the sample for the total population as well as unbiased selection of the sample. Moreover, using this SSI, this paper demonstrates the socio-spatial relationships among the respondents and their proximity to CS facilities perceptions.

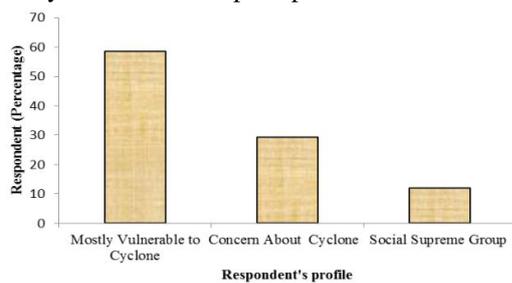


Fig. 2. Respondent’s profile (capacity) on the basis of social supreme index

Physical facilities of cyclone shelter

Location of cyclone shelter

In this study, the most important reason identified why people are not willing to move to the CS during cyclone is the inaccessibility of the CS location. This study reveals that about 20% respondents were satisfied about the CS location while more than half of the respondents were not satisfied. Interestingly, around 30% of the respondent had no comments (Fig.3). This may be due to the political or social systems complexity (Ahmed, 1997). On the other hand, the lower response about the suitability shows the lower use potentials of the cyclone shelters.

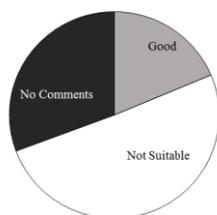


Fig. 3. Perception of the respondents about the location of CS

Facility for women in cyclone shelter

About half of the populations in the study area are women and they are one of the most vulnerable groups due to any sort of disasters. The perceived responses revealed that most important issue for women in CSs during disaster is separate room for them. This view is really important for social-cultural condition of the country. For example, in rural areas of Bangladesh women are not willing to go anywhere if they have to stay close with male persons or without any separation. Moreover, it is the main cause of non-response of women for going to CS during cyclone (Neelormi et al., 2009). In the study area most of the cyclone center perceived to have no separate facilities for women. More than 5% respondent perceived to have separate room facilities for women and experienced kind of clothed barrier facilities respectively. Most of the respondents went to CSs had no experience (around 80%) of separate place for women (Fig. 4).

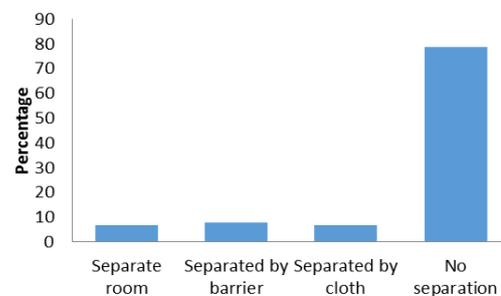


Fig. 4. Perceived separate facility for women in different CS of Dasmina

Drinking water facility in cyclone shelters

The perceived water supply facilities of the cyclone shelters were kind of unsatisfactory relative to the other facilities in and around the CS. Around 36% of the water supply in the CS were from deep tube well and 19% water supply was from shallow tube well. However, more than 30% of the CS had no water facilities. Interestingly 7% of the water supply on CS was from rain water harvesting (Fig.5). These scenarios showed the water scarcity during disaster situation, as 30% of the CS had no water facilities and 7% perceived to have rain water harvesting that has to depend on nature.

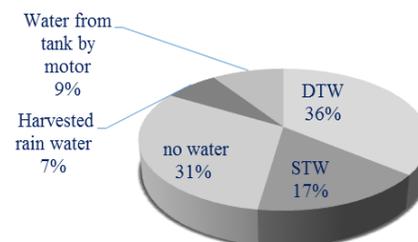


Fig. 5. Perceived scenario of water supply facility in cyclone shelter

Sanitation facility in cyclone shelter

The perceived sanitation facilities of the cyclone shelters were very much unhygienic. Around 45% respondents perceived about unhealthy situation in the cyclone shelter and about 30% observed derelict sanitation facilities. Moreover, about 20% of the respondents perceived no sanitation facilities (Fig.6).

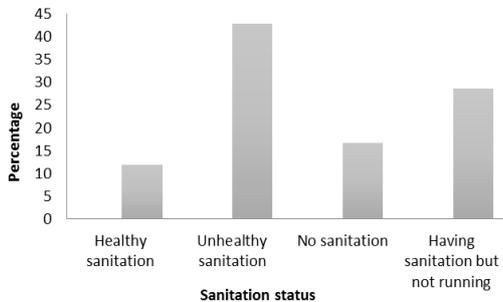


Fig. 6. Sanitation facility in CS

Expectation for sanitation facilities

Sanitation facility was ranked in same way like other chart. Five category were given for respondent choice that separate bathroom for men and women is top most prioritize. This may cause of social views and people confined mentality. They were generally unwilling to use a common toilet or bathroom with opposite gender though it contains enough facilities. The least facilities were the common toilet for all (about 40%) whereas second high priority was given toilet with bathroom (around 25%) (Fig.7).

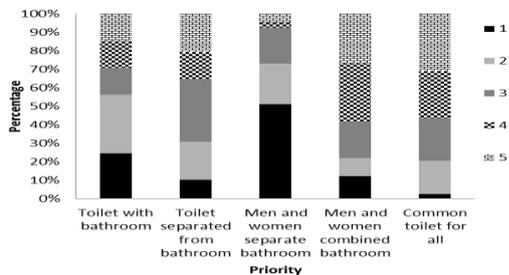


Fig. 7. Expectation Sanitation facility in CS (Here in order of importance 1 is the highest priority and 5 is the least priority)

Expected security for women

Security for women is an important factor in CS. When the question about the women security was asked to the respondents, most priority was given for separate room for women (around 25%) while the least priority was given for the common room facilities (around 15%). In every case it has been prioritized in a same way (Fig.8). This may due to religious and traditional believes of our country. Besides women have to face sometimes sexual harassment in CS that lead to choose separate room facilities for women at the time of emergency (Mallik, 2011).

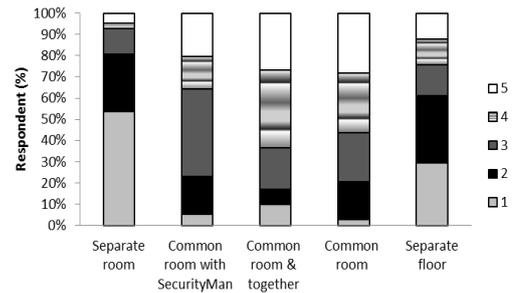


Fig. 8. Respondent's expectations about security for women in CS (Here in order of importance 1 is the highest priority and 5 is the least priority)

Discussion

CS is one of the best means to disaster preparedness and Good perception about the cyclone shelter facilities is a prerequisite for disaster management in the coastal region of Bangladesh (Chowdhury *et al.*, 1998; Benavente *et al.*, 2006; Alam and Collins, 2010). However, no research was conducted to find out the people's requirement on cyclone shelter facilities. Therefore, comparing the results of this study with other similar studies is quite difficult. However, a location suitability research of CS revealed the picture of the cyclone shelter facilities and it is indicated in the research that location choice of the cyclone shelters by the planners are mostly unsatisfactory (Alam and Collins, 2010; Mallik, 2011). This study also studied the perceived cyclone shelter location satisfaction and found that more than 50% of the venerable groups are not satisfied with the location of the cyclone shelters in their locality.

The main point of the research is the study itself. It is the first study that communicated the perception about the cyclone shelter facilities of the south central coastal region, a cyclone prone area of Bangladesh. Moreover, the study revealed the perception of the cyclone vulnerable community in the coastal Bangladesh with highly representative vulnerable group of people. As a result, this vulnerable group has put the real picture of the cyclone shelter facilities on the table. The perceived status of the cyclone shelter facilities also indicated the cause of big number causality during disaster in Bangladesh by revealing the perception of the facilities provided in the cyclone shelters.

Besides strong points there are some weak points of the study. No statistical analysis was done due to the smaller number of data. Besides this, not too many parameters of satisfaction were asked and analyzed in this study. However, these small numbers of respondents were the good representations of the whole vulnerable (cyclone) community of that area (Table 1). The intensity and frequency of disasters are increasing in the coastal region of Bangladesh in the last few decades. This increase of disaster intensities is marked as the result of drastic present climatic variability of the world (Ali, 1996; Mirza, 2003). In these aspects the CS facility satisfaction is an important issue to achieve good disaster preparedness and adaptation. Therefore,

this study can serve as good guideline to the policy maker for improved CS related disaster planning.

Conclusions

Cyclone shelters comprise a widely acceptable form of infrastructural support for disaster management in Bangladesh. The indication from recent cyclone appears one of the most effective tools for reducing cyclone hazard is cyclone shelter. But the existing cyclone shelters in the coastal regions especially Dashmina upazila at Patuakhali were not properly located, designed, facilitated and maintained. The study revealed that the facilities of the CS were not satisfactory according to the most of the respondents. This study also revealed that the establishment of a CS and available running facilities in the studied community was not taken community perception. After completing this study authors found that 51% respondents comments not suitable about location of CS. They also worried about women security because only 62% respondents think no separate room have in the CS. Food and valuable storage facilities were very less (25%) and still now is not recognizable (45%). There was a scarcity in safe drinking water (36% DTW). One of the most important issues is sanitation facility. According to survey result 17% CSs have no usable sanitation and 43% sanitation was unhealthy. Additionally, proper dissemination of early warning and government and non-government partnerships for relief and rehabilitation activities should be prioritized to ensure pro-poor disaster management activities. Most important matters for increasing people numbers to take shelter during emergency period are women separate facilities, location, warning system and awareness among local people about going CS in time to safe themselves. To overcome such constraints, in addition to the participation of people, the societal should be evaluated with respect to the introduction of effective planning practices. The most importance of this study consist into the understanding of people opinions about CS and what they expect in CS as well as to review the existing usable facilities and their accessibility to utilize it.

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