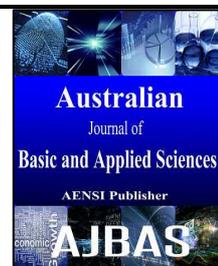




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Scope of Mosques as a potential institution in cyclone prone settlements of Bangladesh

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ABSTRACT

Bangladesh is one of the most disaster prone countries in the world where 32% of the country's total geographic area are the coastal areas. Cyclone is almost a yearly phenomenon in the country. During this disaster, people living in the coastal areas mostly take refuge in the nearby cyclone shelters. In most of the cases, the cyclone shelter acts as a primary school or community center of the settlement. Bangladesh, being a country with Muslims in majority, mosques plays an important part in the daily communal life. Like most of the rural areas in Bangladesh, mosque is one of the paramount physical establishments of the coastal communities. This paper aims to explore the social and physical scopes of utilizing mosques as one of the major disaster management center in the coastal areas.

INTRODUCTION

The aim of this paper is to explore the social and physical scope of mosques as a potential institution in disaster management system in cyclone prone areas in Bangladesh. Bangladesh is one of the top ranking disaster prone countries where cyclone results a huge loss of lives and properties every year. The geographical and climatic conditions of the country are responsible for cyclone and natural disasters.

The situation is aggravated, all the more by its being the most densely populated country in the world (Banglapedia). Cyclone as an extreme natural event which adversely affect the environment of the human settlement of the coastal region. When the annual cyclones roar in, hundreds and sometimes thousands of people are swept away (<http://en.banglapedia.org/index.php?title=Cyclone>).

Almost 85 percent of the people of Bangladesh lives in the rural settlements (Dasgupta *et al.*, 2010) and mosques acts as a center of social and religious activities in these settlements.

This paper will focus on the scope of mosques as potential cyclone shelters in the coastal settlements of Bangladesh. The first part of this paper will discuss upon the disaster of cyclone and the vulnerability. The following section will describe the cyclone management system in Bangladesh and the scope of community based disaster management. At the end the potentiality of mosques as disaster management system will be highlighted with necessary recommendations.

Overview Of Cyclones In Bangladesh:

Cyclone is a tropical storm or atmospheric turbulence involving circular motion of winds, occurs in Bangladesh as a natural hazard. All the tropical seas of the earth with the exception of the south Atlantic and southeast Pacific give birth to deadly atmospheric phenomena known as tropical cyclones. On an average, 80 tropical cyclones are formed every year all over the globe.

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Cyclones hit the coastal regions of Bangladesh almost every year, in early summer (April- May) or late rainy season (October-November). From Indian Meteorological Department (IMD), between 1877 and 1995 Bangladesh was hit by 154 cyclones (including 43 severe cyclonic storms, 43 cyclonic storms, 68 tropical depressions). Of the 508 cyclones that have originated in the Bay of Bengal in the last 100 years, 17 percent have hit Bangladesh, amounting to a severe cyclone almost once every three years. Of these, nearly 53 percent have claimed more than five thousand lives (Pandey, B.H. and Kenji Okazaki, 2005).

Surge can be even more devastating if it makes a landfall during high tide. In general, it has been observed that the frequency of a wave (surge plus tide) along Bangladesh coast with a height of about 10 m is approximately once in 20 years, and the frequency of a wave with a height of about 7 m is approximately once in 5 years (Cyclone Shelter Construction, *et al.*, 2011). According to the IPCC AR4, storm surges and related floods are likely to become more severe with increases in intense tropical cyclones in future (Khalequzzaman, M., 1976). Hence, from a practical perspective vulnerability of Bangladesh to cyclones/ storm surges may increase even more as a result of climate change.

Settlements In Cyclone Prone Areas:

The human settlements in the coastal areas are mostly developed in an unorganized and isolated manner, primarily due to population pressure. The coastal land of Bangladesh (710 km long) is of recent origin formed out of the process of sedimentation. Most parts of the area are, therefore, low lying which can be subject to inundation even under ordinary circumstances of tides.

The effect of cyclone enormously changes the pattern of the settlement of a locality. It acts as a 'push factor' in the coastal settlements for the migration and displacement of the inhabitants. As the cyclone wash away the crop field and farms, at the end of emergency aid, it is much observed that male members of the family started moving towards nearer cities to find an income (M., 2007).

Presently almost 40 million people lives in the coastal areas of Bangladesh (Faisal, M.A., 2012). The coastal area represents an area of 47,211 km² equaling 32 % of the country's total geographical area (PDO ICZMP 2004). Current predictions claim that this coastal area will be increasingly submerged up to 3 percent by the 2030s, 6 per cent in the 2050s and 13 percent by 2080s as a result of a sea-level rise (Cyclone Disaster Mitigation in Bangladesh, 2010).

The consequences of climate-related natural disasters for long-term population mobility in rural Bangladesh (Islam M Rafiqul (ed.) 2004). Their results indicate that flooding caused by cyclone has modest effects on population mobility, particularly, for women and the poor. Additionally, crop failures without considering the flood impacts have also a strong impact of population displacement.

The housing sector experienced maximum damage and loss during the Sidr cyclone in 2007 and accounting by housing/ dwelling type further indicates that "semi-pukka" houses, "kacha" houses and "jhupris" were the predominant categories of damage (Tanveerul Islam, B.U.R.P., 2006).

Cyclone Management In Bangladesh:

Cyclone shelters are the primary establishments in the disaster management systems during cyclone and floods after the cyclone. Cyclone shelter is a structured building, constructed on RCC pillar, the ground floor of which will be kept open for free flow of tidal surges. The structural design will be prepared in such a way so that it can withstand the heavy gusty and squally wind. When specific warnings for cyclone and tidal surges are announced by the appropriate authorities, the buildings would be opened for safe shelters of local communities and cattle.

The local beneficiary communities have to be involved at the time of construction of the shelters so that, later, they can take the responsibility of its management (Rahman, Atiq. Islam, Rafiq, 2010)]. If the organization constructing the multi-purpose cyclone shelter is its user, then the responsibility of the management of the shelter will also fall on them. The responsibility of management of the multi-purpose cyclone shelters in educational institutions will fall on the relevant management committee of the governing body of the institutions under the control of the Ministry of Education and the Ministry of Primary and Mass Education. If the organization/ institution constructing the cyclone shelter surrenders its ownership after the construction, in that case the ownership will be entrusted to the Ministry Disaster Management and Relief.

As per the Standing Orders on Disaster (SOD) 2010, the responsibility for ensuring proper management of all cyclone shelters located in a particular District is vested with the District Disaster Management Committee (<http://www.coastalcooperation.net/part-III/III-3-3-4.pdf>). On behalf of the District Disaster Management Committee, the Deputy Commissioner shall ensure proper sanitation, the safe drinking water and sufficient lighting facilities in all the cyclone shelters (Figure 1) in the district with the help of the Upazila and Union Disaster Management Committees.



Fig. 1: Cyclone shelter in Dublar Char, Bangladesh, recently withstood a cyclone and saved many lives. (Source: Gerhard Tauscher, International Federation of Red Cross & Red Crescent)

The management committee of the cyclone shelter according to National Plan for Disaster Management 2010-2015:

- Chairperson: Union Praishad Member of the concerned Ward Members:
- Headmaster of the local Primary School
- Chairperson/Imam/Religious Leader of local religious institution
- Female member of the concerned Ward
- A representative of the Cyclone Preparedness Program
- A representative of the Private organization/NGO Member Secretary: A member of the Union Disaster Management Committee

The first purpose-built cyclone structures were built in 1960s. After the cyclone in 1991, the Bangladesh government with the support of different foreign agencies, have been building multi-purpose cyclone shelters so that these can also be used as primary schools during the normal period of time. According to Local Government Engineering Department, in 2006 there were about 2500 cyclone shelters in the country (Utaberta, N., *et al.*, 2015). Bangladesh has developed a GIS-based information system for all existing cyclone shelters. Quite a number of cyclone shelters have been neglected, others have been abandoned altogether. As the shelters can accommodate only 27% of the population at risk (Utaberta, N., *et al.*, 2015), more cyclone shelters are planned to be built soon in the low-lying coastal districts.

Scope Of Community Based Disaster Management In Bangladesh:

Most of disaster response can be characterized as command and control structure one that is top down and with logistic center approach (Tajuddin, M., *et al.*, 2010). Because of this, lack of community participation that results into failures in meeting the appropriate and vital humanitarian needs, unnecessary increase in requirement for external resources, and general dissatisfaction over performance despite the use of exceptional management measures are being observed.

Recognizing these limitations, the Community Based Disaster Management (CBDM) approach promotes a bottom-up approach working in harmony with the top - down approach, to address the challenges and difficulties. To be effective, local communities must be supported into analyzing their hazardous conditions, their vulnerabilities and capacities as they see themselves.

The CBDM approach provides opportunities for the local community to evaluate their own situation based on their own experiences initially. Under this approach, the local community not only becomes part of creating plans and decisions, but also becomes a major player in its implementation (Asif, N., *et al.*, 2015).

Potentials Of Mosque As A Disaster Management Center In Rural Bangladesh:

Mosques as a communal meeting and decision making place, have the potentiality to contribute its scope in community based disaster management system (Utaberta, N. and H. Othman, 2011). In regards to the issue of engaging mosques and empowering communities for sustainable disaster risk management, following can be achieved:

1. By empowering the community, a holistic secure-livelihood approach enhances sustainability.
2. As a social institution, mosques can perform disaster awareness, mitigation, preparedness, response and recovery (Utaberta, N., *et al.*, 2015).
3. To make a disaster resilient community
4. Transparency of activities and dissemination of knowledge and information through mosques can encourage people's participation in activities.

By involving the community people in the disaster management process through the mosques, local community not only becomes part of creating plans and decisions, but also can become a major player in its implementation (Utaberta, N. and H. Othman, 2011). Figure 2 shows the guidelines of building mosques as cyclone shelters

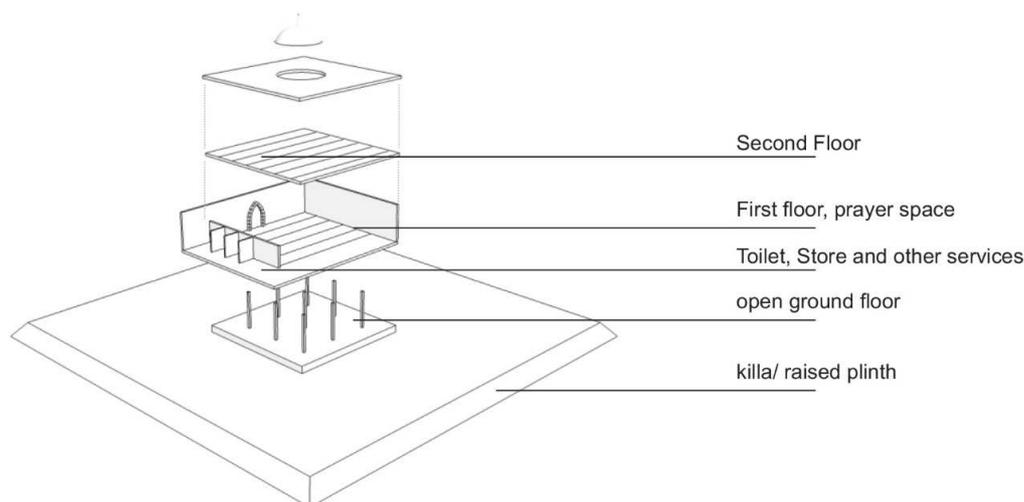


Fig. 2: Guidelines of building mosques as cyclone shelters

Raised plinth height of the cyclone shelter must be raised above the height of flood level. The plinth, which is often build of earth and tends to be completely washed away during floods, can be made stronger with a little cement and some pieces of stone and brick. In this way, the plinth may last through repeated floods. Similar raised ground constructions are being integrated into the design of coastal embankments for isolated communities.

Installing toilets on raised ground:

Most of the toilets in cyclone prone areas are built by digging the earth and setting up the rings made of concrete in it. During the flood season toilets go under water, cause problems for people especially for women. This creates furthermore water pollution problems. In order to overcome this, people install toilets on raised ground (Tajuddin, M., *et al.*, 2010).

Raised tube well:

Tube wells are the most common clean water source in Bangladesh. There are an estimated 8 -10 million tube wells throughout the country. The water source can be protected against floods, by raising the suction head of the tube well above the level of rising flood water by using an additional pipe.

Food and Medicine preservation:

Floods create scarcity of food. For this reason, people of flood prone areas preserve dry foods for use in flood emergencies. The food which is preserved before the flood are Muri (puffed rice), Chira (pressed rice), Sugarcane Molasses, Naru (made of coconut and molasses), dried jackfruit seeds (Tajuddin, M., *et al.*, 2010). Clean freshwater is also a scarce commodity during floods. The food and water are stored above averaged flood level.

Community-based initiatives empower the communities to build on their existing local knowledge and provide confidence to the most vulnerable people to explore the long-term benefits of investing small amounts on flood-resistant construction towards making safer homes (Tanveerul Islam, B.U.R.P., 2006).

The shelter to be constructed with the foundation of at least three stories shall have six rooms and RAMP facilities up to first floor. A reasonably sized room should be kept reserved for the disabled & helpless people and the rest of the first floor should be kept open for domestic animals.

The local beneficiary communities have to be involved at the time of construction of the shelters so that, later, they can take the responsibility of its management. If the organization constructing the multipurpose cyclone shelter is its user, then the responsibility of the management of the shelter will also fall on them. The responsibility of management of the multi-purpose cyclone shelters in educational institutions will fall on the relevant management committee of the governing body of the institutions under the control of the Ministry of Education and the Ministry of Primary and Mass Education (Tajuddin, M., *et al.*, 2010). If the

organization/institution constructing the cyclone shelter surrenders its ownership after the construction, in that case the ownership will be entrusted to the Ministry Disaster Management and Relief.

Conclusion:

Cyclone is an inevitable disaster in the coastal areas of Bangladesh which can be mitigated by incorporating the proper institutions in the disaster management system that can empower the people by participation. Mosques as a social institution of the root level have the potentiality to involve people of all ages into the disaster management system. This paper discussed about the scopes of being mosques as a community level disaster management center. Further study and analysis on this subject can focus on the architectural features and structural requirement of the mosque in different contexts of localities. For assessing the feedback from the people to get engaged in the participatory disaster management system through mosques, further social analysis is recommended to be done.

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