

Shelters and Schools

Adapting to Cyclonic Storm Surges: Bangladesh

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Introduction

Bangladesh is one of the most natural disaster prone countries. Over the last 40 years many cyclones have affected the country accompanied with loss of lives and property. Global climate change will make the country even more vulnerable to cyclones and floods. 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, social injustice, and damaged ecosystems.

The poor people have the least capacity to absorb shocks and adapt to the adverse impacts of climate change. Thus, the poor are the most vulnerable to climate change impacts and disaster risks (Rahman, 2009).

Adaptation

Adaptive measures are necessary to reduce the vulnerability of people to flooding. The construction of shelters at a household scale save lives and properties, as shown during the last decade. Adaptation should reduce risk and vulnerability from extreme events: cyclones and storm surges and impacts of climate change. Adaptive measures should be geared to increase resilience and provide security in terms of food, water, and energy supply as well as safeguarding livelihoods and social coherence. Some examples:

Shelters as a way to adapt

The construction of shelters save lives and properties.

A cyclone shelter is basically a solid building, an elevated construction that provides security from the cyclones and associated storm surges. The foundations are such that they dissipate energy from upcoming cyclonic storm surges from the sea or from riverine floods. Above it, at some metres from the ground, one or more floors are constructed to provide shelter. Sometimes they are built in a semi pyramidal shape to withstand the storm surges better.

Each shelter is designed to serve approximately 2000 people and also to function as schools. Access ways are major issues. Studies have shown that unless a cyclone shelter is within 1.5 km of a house, it may be too distant. The local people, afraid for theft, postpone their withdrawal to the shelter to the eleventh hour. Moreover, women going at the last moment in case shelters are lacking proper women toilets and are therefore disproportionate victim of last minute drowning. New generation of shelters are better equipped.



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

Shelter programme

The first purpose-built cyclone structures were built in 1960s. Since the Great Bhola Cyclone of 1970, a Category 4 cyclone that brought a storm surge of up to 27 feet and killed an estimated 350,000-550,000 people, Bangladesh embarked on program to build concrete cyclone shelters. However, these efforts were insufficient and in 1991 more than 140,000 people died from another tropical cyclone. After this cyclone, 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 (Islam, 2006). 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.

More shelters needed

As the shelters can accommodate only 27% of the population at risk (Islam 2004), 2000 more cyclone shelters are planned to be built soon in the low-lying coastal districts.

The May 2009 Cyclone Aila confirms the importance of shelters. The Cyclone struck the coastal areas of Bangladesh with very high wind speeds. According to the Government of Bangladesh, the cyclone killed 190 people, injured more than 7,000, and damaged or destroyed more than 500,000 houses (www.usaid.gov). The lower death tolls in recent years can be attributed to a network of cyclone shelters after the 1970 disaster and a SMS warning system recently introduced (AFP, June 2009).

Construction of new cyclone shelters has started under different donor-funded programmes.

Raised plinth height

Another example of living with floods is the raising of the plinth height above the flood level. It is a method, which can be promoted at the household 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 (IFRC, 2008). Similar raised ground constructions are being integrated into the design of coastal embankments for isolated communities.

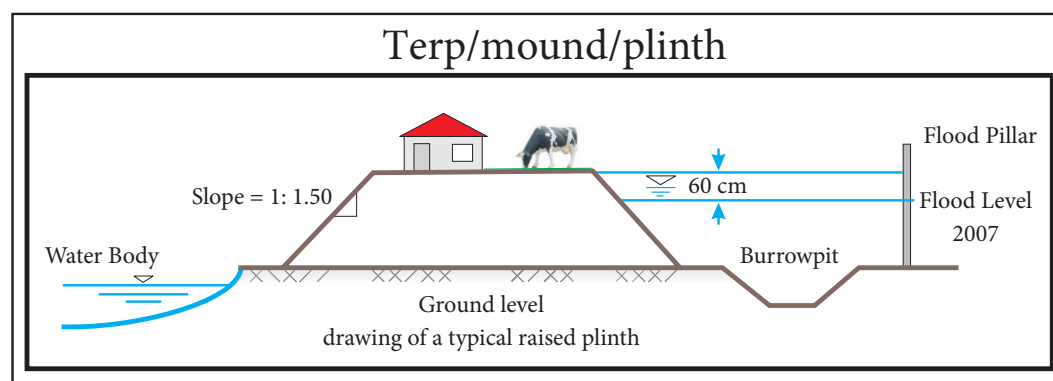


Figure 1: A raised terp - plinth (source: Chars Livelihoods programme)

Installing toilets on raised ground

Most of the toilets in flood 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 (Rahman, 2008).

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.



Raised mound for toilets.
(source: Chars Livelihoods programme)

Safeguarding food and freshwater is an urgent matter during flood.
(source: Chars Livelihoods programme)

Food 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 (Rahman, 2008). Clean freshwater is also a scarce commodity during floods. The food and water are stored above averaged flood level.

Conclusions

Adaptive measures such as the construction of (multi-purpose) shelters and measures at a household scale, are important to save lives, property and livelihood. 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 (IFRC, 2008).

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