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EMERGENCY TEMPORARY SHELTER FOR NATURAL DISASTER LIKE FLOOD

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Abstract: - Disasters are unstoppable natural and anthropogenic impacts causing serious effects on the human beings and all other living creatures. Temporary dwellings constitute a crucial step of recovery and reconstruction in the post-disaster aftermath ^[1]. India is highly prone to natural and anthropogenic disasters like flood, earthquake, cyclones, etc. Providing temporary shelter for vulnerable population during and after an emergency is one of the most difficult challenges. In this study, we find out the problems in the existing materials used for making out the temporary shelters for natural disaster like flood.

Keywords: Emergency shelter, temporary, natural disaster, flood



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INTRODUCTION

Floods are the most damaging types of natural disasters. They occur mainly due to excess rainfall and overtopping of rivers. Due to the high frequency waves of flood water, some buildings gets damaged and some gets demolished, and there arises a need of rescuing and shifting the affected human beings to the safe place. Due to flood, the affected people become shelter less.

The importance of temporary shelters stems from the role they play in incubating people and providing a habitable environment while the outcomes of a disaster are being assessed and then rectified^[1]. Temporary shelters are very useful for accommodating the rescued people's during natural disaster like flood. Temporary shelters can be defined as structures to incubate people living in communities which have been affected by a disaster (commonly referred to as disaster survivors)^[1].

a. DISASTER HISTORY:

i. Assam (2017 - flooding):

Flood Summary:

The first wave of flooding began soon after the onset of the monsoon rainfall in early June, affecting 60,000 people in 3 districts: Lakhimpur, Karimganj and Darrang. By late June flooding had affected just under 100,000 people across 150 villages. Although flood waters had receded in some districts, areas of karimganj were still under water in flooding that had continued for almost a month. Across the state as a whole, 6 districts and a total of 270,000 people were affected.^[2]

The event occurred in Assam, India, in the late June to July 2017, around June 25, 2017 due to long – term rainfall and the type of flood was river flood.^[2]



Fig. – 1 Floods in North Lakhimpur, Assam 13 July, 2017. Photo Courtesy: Government of India

ii. Uttarakhand flood, 2013:**Flood Summary:**

In June 2013, a multi-day cloudburst centered on the North Indian state of Uttarakhand caused devastating floods and landslides becoming the country's worst natural disaster since the 2004 tsunami. The reason the floods occurred was that the rainfall received was on a larger scale than the regular rainfall the state usually received. The debris blocked up the rivers, causing major overflow. The main day of the flood is said to be on 16 June 2013. Though some parts of Himachal Pradesh, Haryana, Delhi and Uttar Pradesh in India experienced the flood, some regions of Western Nepal, and some parts of Western Tibet also experienced heavy rainfall, over 89% of the casualties occurred in Uttarakhand.^[5]



Fig. – 2 Kedarnath flood, 2013^[10]

b. TOTAL LOSS:**i. Assam (2017-flooding):**

A total of 44 people died in the flood which occurred in Assam between June 25 to July 14, 2017. A total of 48,483 people were evacuated till July 12, 2017 from the date of occurrence of the event. Over 4,000 of those displaced were in Lakhimpur; 5,500 in Kokrajhar and 5,600 in Golaghat. The total crop damage done during the Assam flood which occurred between June 25 to July 12, 2017, was 140,837. ^[2]

II. Uttarakhand flood,2013:

In the Uttarakhand floods, the destruction of bridges and roads left about 100,000 pilgrims and tourists trapped. The Indian Air Force, the Indian Army, and paramilitary troop's evacuated more than 110,000 people from the flood hit areas. More than 5,000 people were presumed dead.^[3]

c. MAGNITUDE:**a) Assam (2017-flooding):**

The river level was 28.54 metres in Brahmaputra river, Dhubri on July 3, 2017 and the danger level of the river is 28.62 metres. The river level was 19.65 metres in Barak river, Annapurna Ghat, Cachar district on July 3, 2017 and the danger level of the river is 19.83 metres. The river level was 65.47 metres in Brahmaputra river, Tezpur on July 14, 2017 and the danger level of the river is 65.23 metres. The river level was 15.31 metres in Kushiyara river at karimganj on July 14, 2017 and the danger level of the river is 14.94 metres. The river level was 29.51 metres in Brahmaputra river at Dhubri on July 14, 2017 and the danger level of the river is 28.62 metres. The river level was 36.61 metres in Brahmaputra river at Goalpara on July 14, 2017 and the danger level of the river is 36.27 metres.^[2]

b) Uttarakhand flood,2013:

According to the Indian Meteorological Department, rainfall in Uttarakhand during the week of 20th to 26th June 2013 had been in excess by 37 percent of normal rainfall. During this period, the state received 73.3 centimetres of rain while the normal rainfall is usually 53.6 centimetres. The heavy rains in the region have led to extensive flooding, landslides and destruction to property and lives.^[4]

d. SERVICES PROVIDED TILL DATE AFTER FLOOD:

The services provided till date after flood are as follows:

- Providing food packages through helicopters to affected people.
- Rescuing the affected people by means of boats.
- Rescuing the affected people by means of rings or swim tubes.
- Shifting the people to the nearest locality which is not affected by flood.

- Providing temporary shelters to the rescued people in the nearby locality not affected by flood.
- Rescuing people by means of helicopters by throwing ropes from the helicopters.
- Instant removal of flood water through various methods.

1. TYPE OF STRUCTURES

Shelters in the form of tents are provided in the nearby locality not affected by flood and the rescued people are brought there and are provided with all the necessary daily requirements. Some people are accommodated in the terrace of the high rise buildings in the flood-affected areas. Floating structures built using bamboo poles are also provided.



Fig. – 3 Emergency disaster relief tent shelter^[11]

2. MATERIALS

Tarpaulin:

A **tarpaulin** or **tarp**, is a large sheet of strong, flexible, water-resistant or waterproof material, often cloth such as canvas or polyester coated with polyurethane, or made of plastics such as polyethylene^[5].

In the temporary shelters provided during disasters like flood, tarpaulin is used widely as it is a waterproof material and it gives protection against heavy rainfall. The tarpaulin is supported on the bamboo stick in the middle and is tied to the ground by using ropes.



Fig. – 4 Temporary shelter after disaster made out using tarpaulin^[12]

Bamboo poles:

Bamboo poles are the lightweight materials which are easily available from the bamboo trees. In the flood affected areas where the bamboo poles are easily available, the temporary shelters are made out using it by inserting them directly into the ground on all the four sides and providing a surface for sitting by placing the set of bamboo sticks tied together at some level above the ground surface or above the flood water which is to be rest by bamboopoles provided on all the four sides. The whole structure is covered by providing the jute bags on the topmost part of the shelter.



Fig. – 5 Temporary shelter made out using bamboo poles during flood^[13]

3. COSTING

Tarpaulin: The HDPE tarpaulin costs Rs.2- Rs.50 per sq. feet based on its size and strength of material used.

Bamboo poles: The bamboo poles costs approximately Rs.10 per foot.

4. CONCLUSION

From this study, we concluded that the present temporary shelters used during natural disaster like flood have a very low frequency of accommodating the affected people and also have some negative impacts. As the bamboo poles are not waterproof, there is a risk of structure getting decayed on long exposure to flood water, so use of bamboo poles should be minimized for temporary shelters during flood. As tarpaulin is waterproof, we should find out the way of using it in temporary shelters during flood, but with some modifications. We also concluded that we should provide the lightweight shelter with easy to transport facility which can be used as emergency temporary shelter for natural disaster like flood.

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