

# LIVING BESIDE NATURAL DISASTERS

## ABSTRACT

A terrible roaring makes people confused and all of a sudden, the ground starts shaking. Apparently, disasters are not finished. Houses are destroyed, breathe stop and for a moment, there is silence, absolute silence. All wishes and ambitions are re buried under a mountain of soil...

This is a repeated story of Iranian peasant lives that live in instable houses. Iran with many old and young faults is one of areas susceptible to earthquake in the world. The fact is that we can't escape from these natural disasters, but it is possible to live with these disasters.

In this paper, we first propose a construct of an **emergency shelter**. Then, we investigate the potential of its transformation in to a **temporary shelter** that led to occurrences in **Azarbayejan, August 2012.**



<p>Name of the students:</p> <p>Ashkan Shirani Maryam Jahanbazi</p>	<p>University:</p> <p>Art University of Isfahan University of Khorasgan Department:</p> <p>Department of Architecture and Urban planning</p>	<p>Name of the supervisor:</p> <p>Dr. Mehran Gharaati</p> <p>Department:</p> <p>Department of Architecture and Urban planning</p>	<p><b>6th i-Rec student competition</b></p>
<p>Emails:</p> <p>Ashkan.shirani@gmail.com Maryam.Jahanbazi@gmail.com</p>	<p>Postal address of the Department:</p>	<p>Email of the supervisor:</p> <p>MehranGharaati@gmail.com</p>	<p>Country:</p> <p>Iran</p>
<p>Telephone number:</p> <p>00989131015036</p>	<p>Telephone number of the Department:</p> <p>00983112218200</p>	<p>Telephone number of the supervisor:</p> <p>00989131672757</p>	<p>Date:</p> <p>5/10/2013</p>

## Part 1 : EMERGENCY SHELTER

Different earthquakes have occurred in three geographical points of Iran in short period of time from August,2012 to April,2013.

### 1. Azarbaijan\_e\_Sharghi, 11, August.

Climate: **Cold and mountainous**

a) 6.2 Richter

b) 6.1 Richter

Losses: 180 people were killed, 1500 people were wounded, 60% to 100% of 465 villages were destroyed.

### 2.Booshehr : 9, April, 2013, 6.3 Richter.

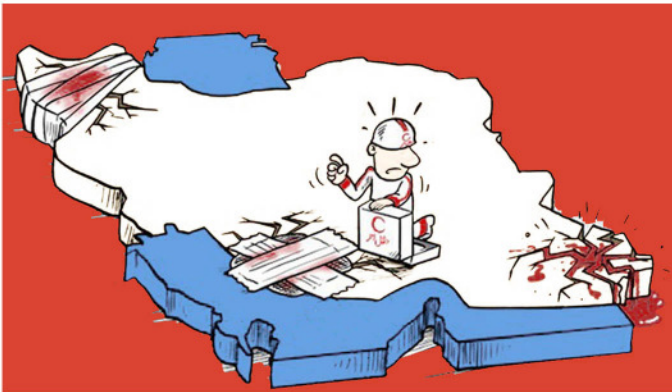
Climate: **Tropical**

Losses: 40 people were killed, 850 people were wounded.

### 3.Sistan va Baloochestan, 16 April, 2013, :7.8 Richter,

Climate : **Province**

1 person was killed and 5 people were wounded



These 3 disasters in a row show that people and the government should prepare themselves to face disasters. The first step to approach this is **handling emergency habitat**



Azarbaijan



Booshehr



Sistan

## CONCEPT

The shelters are usually setting up by victims most of whom hurt physically or mentally, besides, they are not familiar with structures and details at all; so, it must setting up in easiest and quickest way.

The impact of Environmental factors on shelter should be minimized; so it can synchronized with various conditions and climates

The package should be small as much as possible to be easy to transport

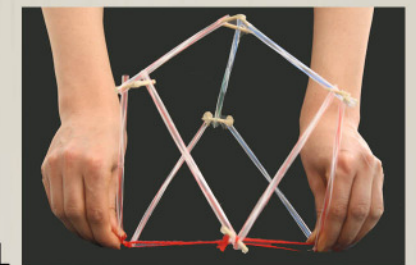
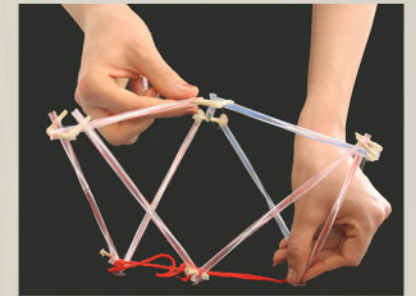
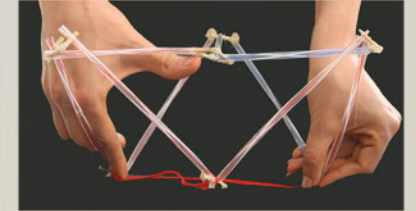
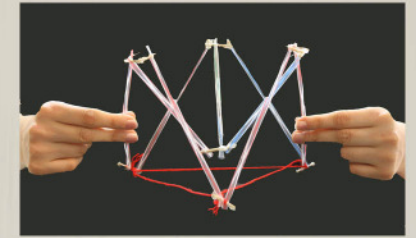
The shelter should support various activities of clients

## PRACTICAL MODEL

Use retractable joints which are prefabricated in order to :

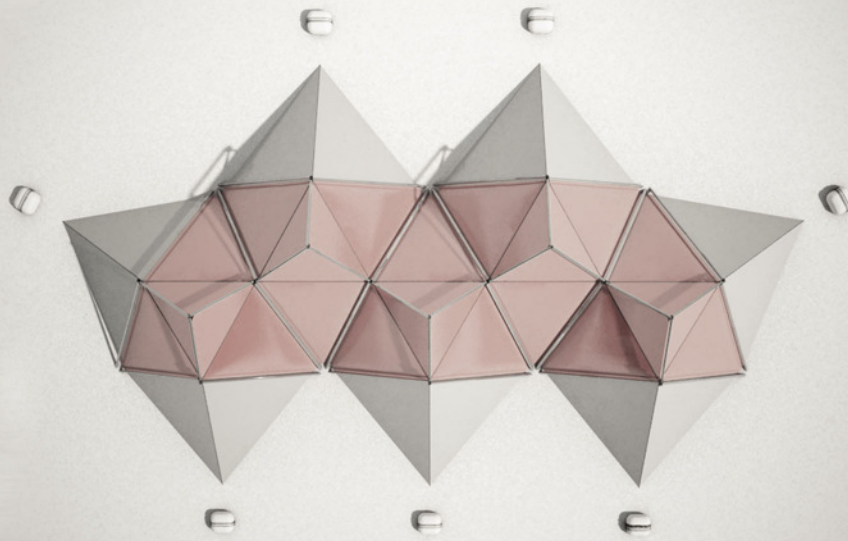
- Speeding up the process of setting up the structure and make it easier.
- Minimizing the size of the package.
- Being capable of creating various forms.

Triangular form of the primary structure in order to be balanced easily in sloping ground or even in rough terrain.

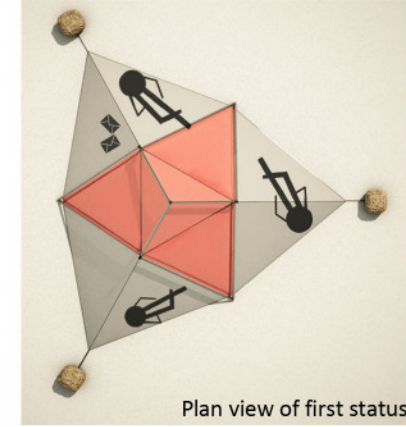


Following point can be considered about shelter designing in a country such as Iran which is susceptible to earthquake and has many various cultures and these different kinds of climates (cold and mountainous, tropical and moderate).

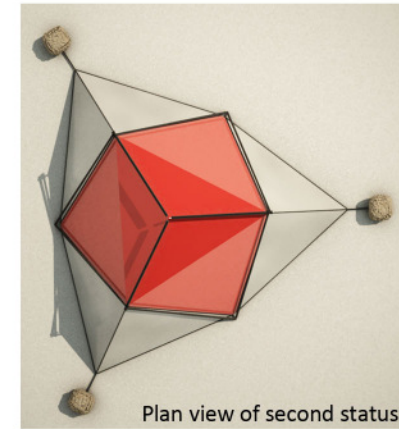
- 1\_Energy
- 2\_Flexibility (in construct and adaptability)
- 3\_Time
- 4\_Expenditure
- 5\_Expandibility
- 6\_Culture



**Expendibility** The triangle shape of the tent provides it the possibility to extend from every edge.



Plan view of first status

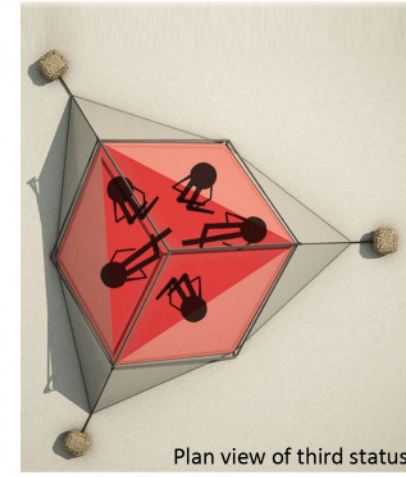
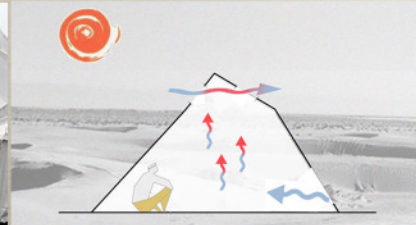
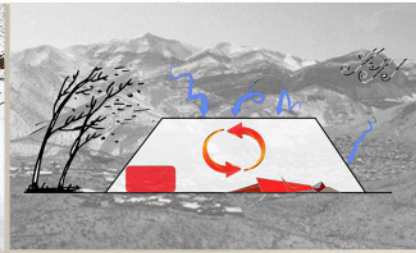


Plan view of second status

A triangle central space and three triangle spaces in corners; In this status, the shelter is more efficient for Individual activities

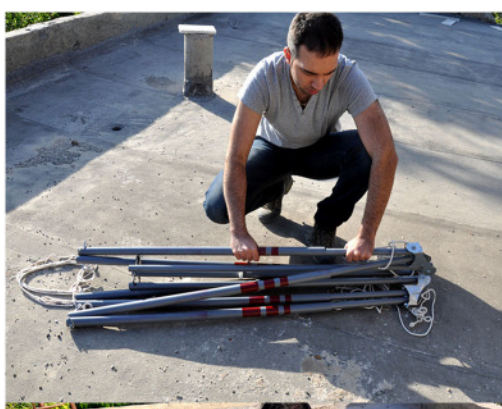
Normal status of the shelter

The **flexibility** is associated to size change of main constructs by a cable that adjusts height to width ratio. Different forms facilitate adaptability to different different activities of clients or various climates.



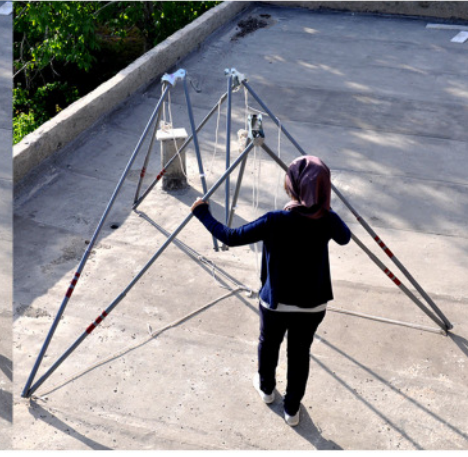
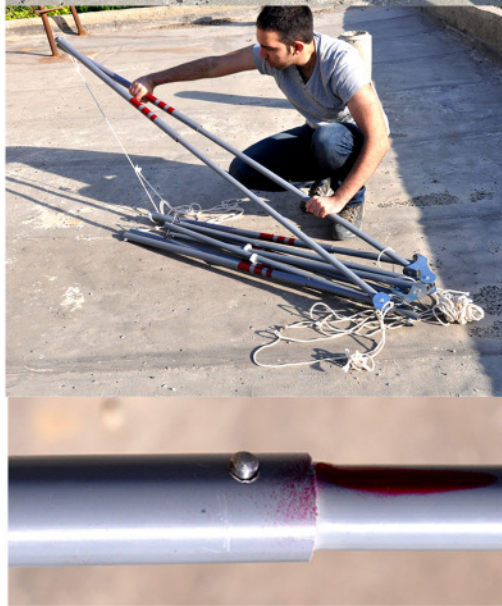
Plan view of third status

A central hexagonal space: In this condition, the shelter is more efficient for communal activities like eating or Convening

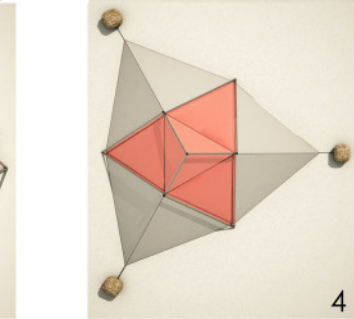
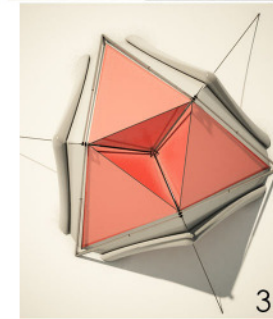
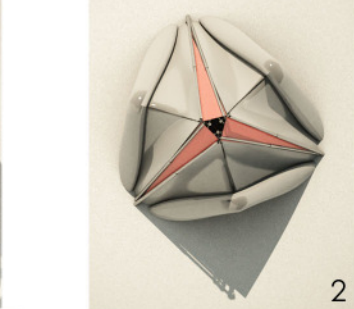
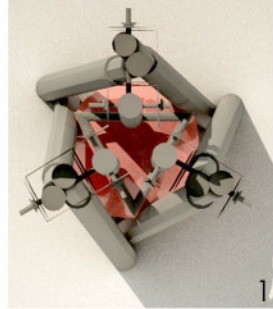


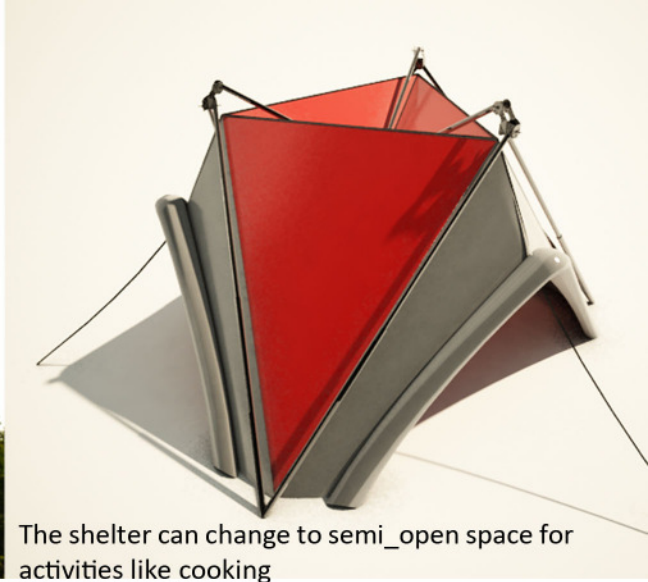
## A prototype of the shelter.

The process of **setting up** the shelter is one of the most important factors of emergency shelter. A prototype is built to ensure the function of the joints, tensile and compressive elements, besides, the quickness and easiness of setting up the shelter.



## 4 steps of setting up the shelter in plan view

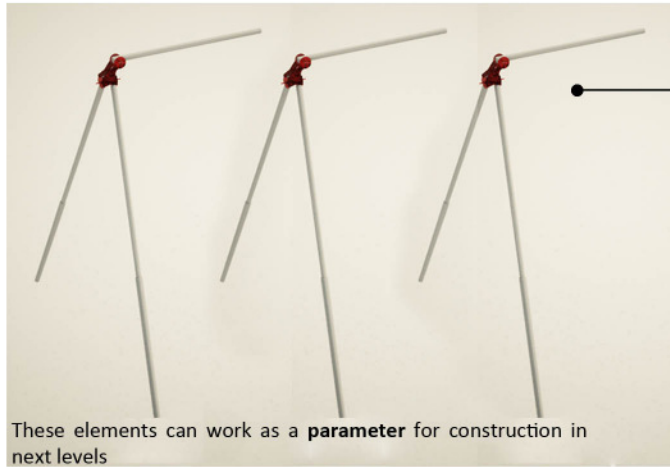




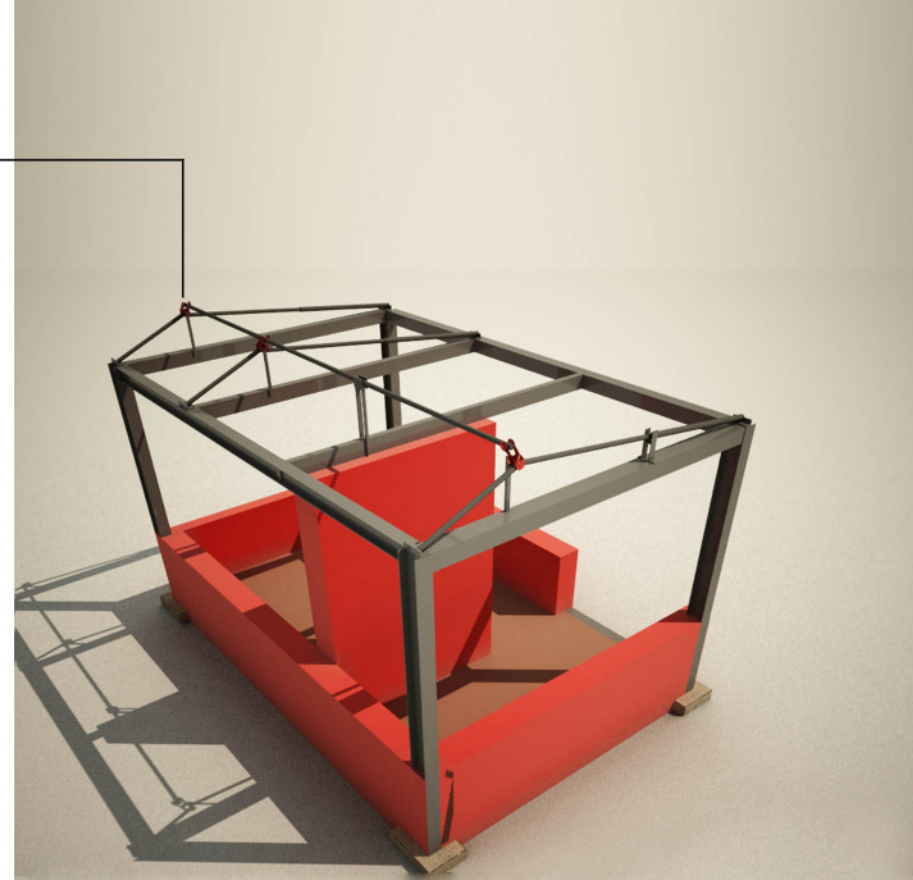
DETAILS AND JOINTS



# TEMPORARY SHELTER



These elements can work as a **parameter** for construction in next levels



## PROBLEM DEFINITION

- 1- Winter is coming and there is not enough time to construct the permanent houses completely
- 2- Too much houses were destroyed and the budget is not enough to reconstruct completely at one stage

## IDEA

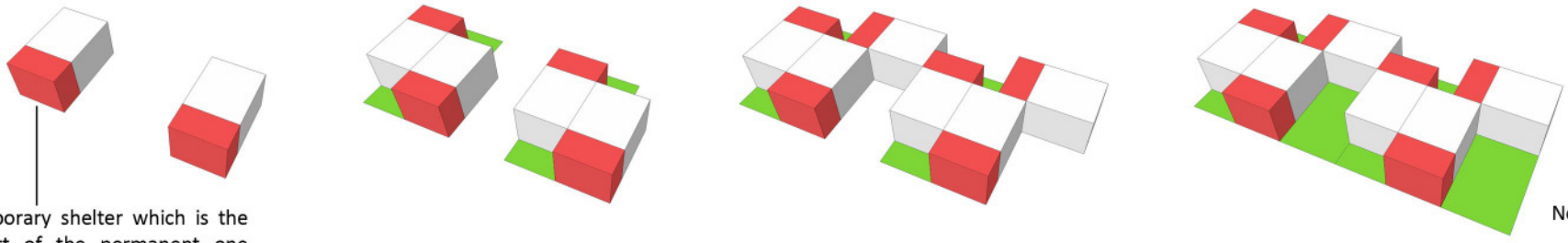
Install the foundation and frames of permanent houses and use temporary materials to cover the walls and roofs to face the winter



**Saving money** : That would be great if emergency shelter could be a part of temporary one



# INCREMENTAL STRATEGY



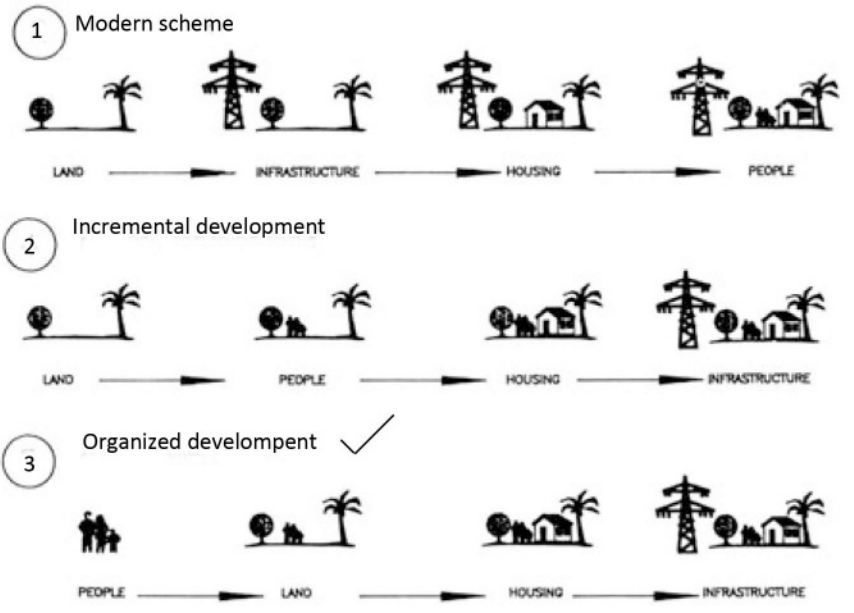
The temporary shelter which is the main part of the permanent one

Neighborhood and formation of yards

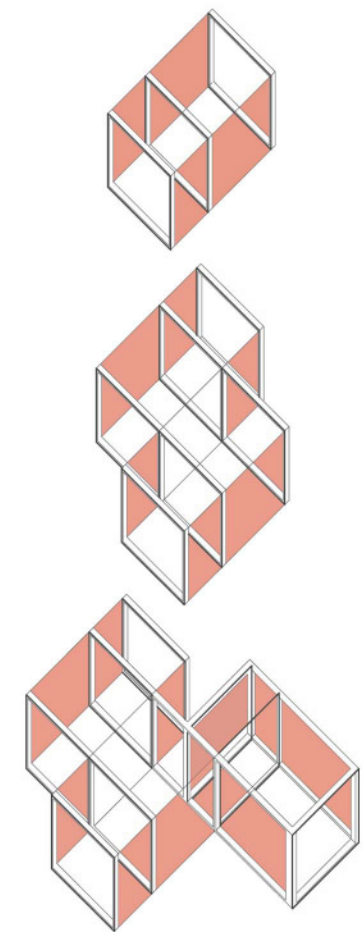


Alternative section of permanent house

# PART 2 : AZARBAYEJAN EARTHQUAKE



Neighborhood and open spaces



Extension of the structure from temporary shelter to permanent house

How countries incorporating different measures to control natural hazards is highly influenced by the level of scientific development of that country. In other words, incorporation of science in making improvements is what differentiates between developed and non-developed countries.

The results of using this method can be seen in countries where crisis are managed based on scientific approaches. In recent years, authorities are more inclined toward using risk management methods based on science as opposed to specify higher safety level against natural hazards. In fact, this method of approach is highly dependent on **sustainability**.

