Higher Problem

Inability to adapt housing designs according to the changes in surroundings

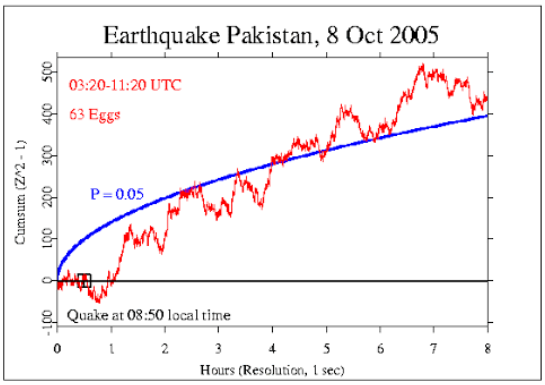
Problem Statement

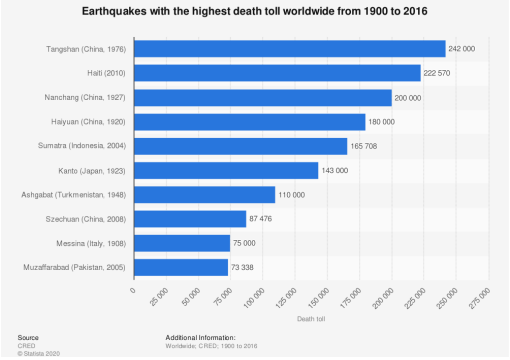
Housing Design in Pakistan is not up-to-date according to the changing climatic conditions in Pakistan.

Areas I am covering for updating housing Design and why they need to be updated?

-> Earthquake proof housing:

Many areas of the world are moving towards earthquake proof housing (as in Japan) due to increase in sudden pressure on earth via various climatic changes. Same is the case with Pakistan and if Pakistan does not move towards this housing design then things might get worse than the earthquake of October 8th, 2005 and these accidents might become common till 2030. Therefore, it is always a better idea to think of future and design for it in the present.

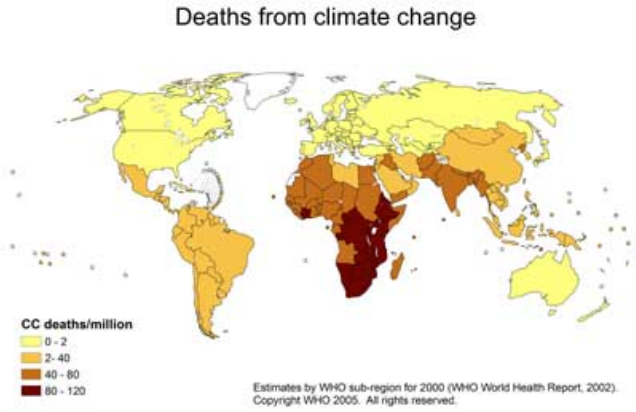




-> Climate resistant housing:

Studies reveal that global warming is increasing day by day to air and other pollutions and owing to this global warming there is becoming and insulating layer around the outer surface of earth which makes heat trapped in the earth's surface and does not let it in during winters. Therefore, the seasons are becoming intense year by year. Intense hailing is an effect of global warming which can be witnessed from Pakistan and a lot of houses get destroyed in these severe weather conditions. Therefore, it is highly required to adapt the housing design that is climate resistant to a large extent. These houses are termed as resilient homes and many countries are adapting this housing design.
These problems are well summarized as:
"A milder climate will reduce the durability of building materials and affect the indoor climate of buildings. Warmer summers will introduce a greater need for cooling.

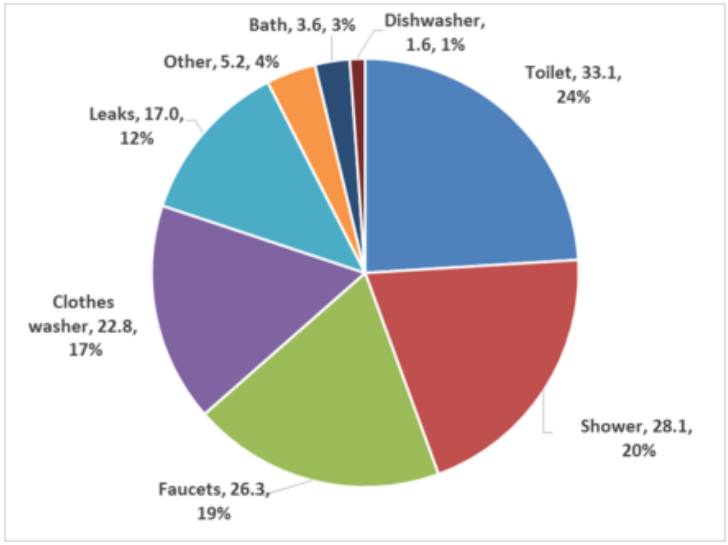
Higher groundwater levels, higher water levels in streams and watercourses, and greater risk of storm surges along the coastline, make it pertinent to safeguard buildings against seepage and flooding". (Climate change impacts on buildings and construction.



-> Energy conservative houses:

"Pakistan receives around 145 million acre feet of water every year but can only save 13.7 million acre feet"(Water Crisis: Why is water running dry?). Moreover, "According to WWF-Pakistan, the depletion of groundwater in Lahore has reached critical levels with the rate of about 2.5 to 3.0 feet per year. ... It is projected to recede below 230 feet in most areas by 2025 if groundwater is not conserved and the present trend of extraction continues"(The Dawn).

As we can see from above citations that natural resources of water are depleting at a faster rate in Pakistan. Water is the basic need of every individual and a lot of water is wasted in housing. Moreover, electricity in Pakistan is generated from coal and water. Former produces intense pollution while the latter is at risk of depleting so there should be something for the conservation of these resources installed inside the houses.


Bath, 3.6, 3%
Dishwasher, 1.6, 1%
Other, 5.2, 4%
Toilet, 33.1, 24%
Leaks, 17.0, 12%
Clothes washer, 22.8, 17%
Shower, 28.1, 20%
Faucets, 26.3, 19%

Suggestions:

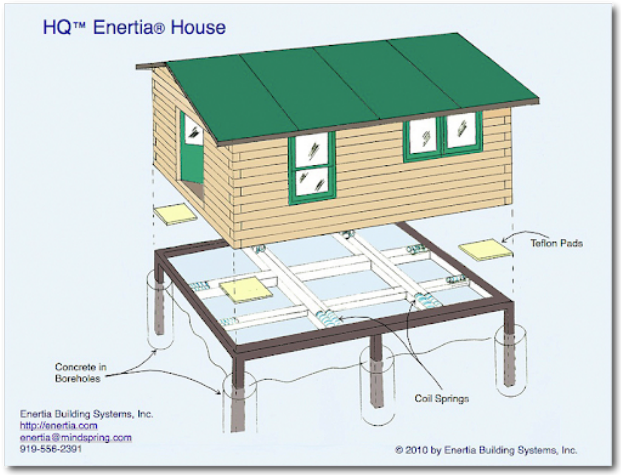
->Regarding EarthQuake:

High and strong basis:

Basis of houses in pakistan can be made stronger and larger so that the shock from earth don't directly affect the floor of the house rather the stronger and higher base. In some hilly areas of Pakistan, this design is tried to be implemented by some rich people in their houses but is very rare but is the demand of every house especially in hilly areas.

Damping:

Damping of basis acts like a shock absorber in bikes in which a fluid is added to base of the house which absorbs the sudden effect of shock from the house and can be very helpful in preventing major losses from earthquakes.

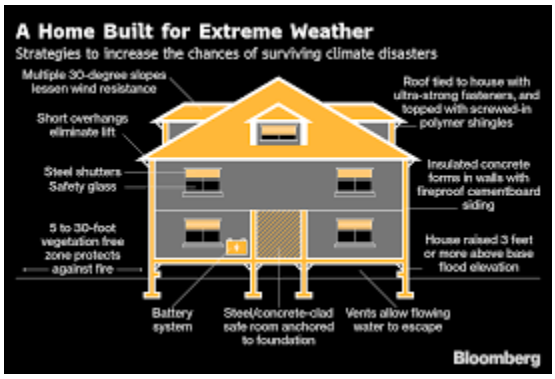


->Regarding Climate Resistance:

Automatic air conditioners in the walls of houses should be installed which could adjust the inner temperature of houses at a certain bearable level so severe weather conditions will not affect housemates much. These air conditioners could also be manually adjusted.

Moreover, strong and larger basis are also necessary to prevent severe weather conditions including storms and floods. Certain heights of houses above ground should be fixed for houses.

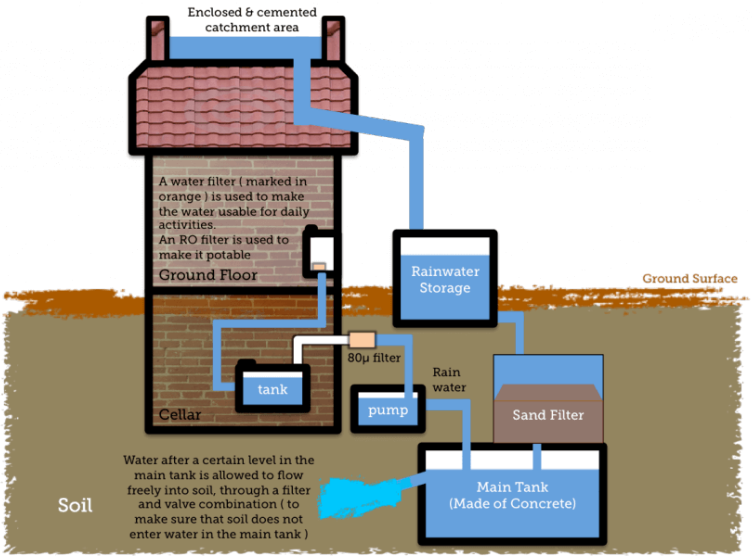
Sloppy houses in hilly areas prevent snow falling and hailing water stuck on the roofs but as hailing is increasing yearly in plain areas then sloppy roof is also a recommendable design in plain areas till 2030 otherwise it can damage houses by seeping water into its basis and weakening them.



->Regarding Resources Conservation:

Water Conservation:

An underground system of storing water should be present with the houses or a particular street where a water measuring scale with a set limit will be present and a filter plant will be activated as soon as the water usage of that particular house or street reach the set limit. This will recycle a particular amount of water again and again and water preservation will become easier.
(A LUMS professor is already working on this project).

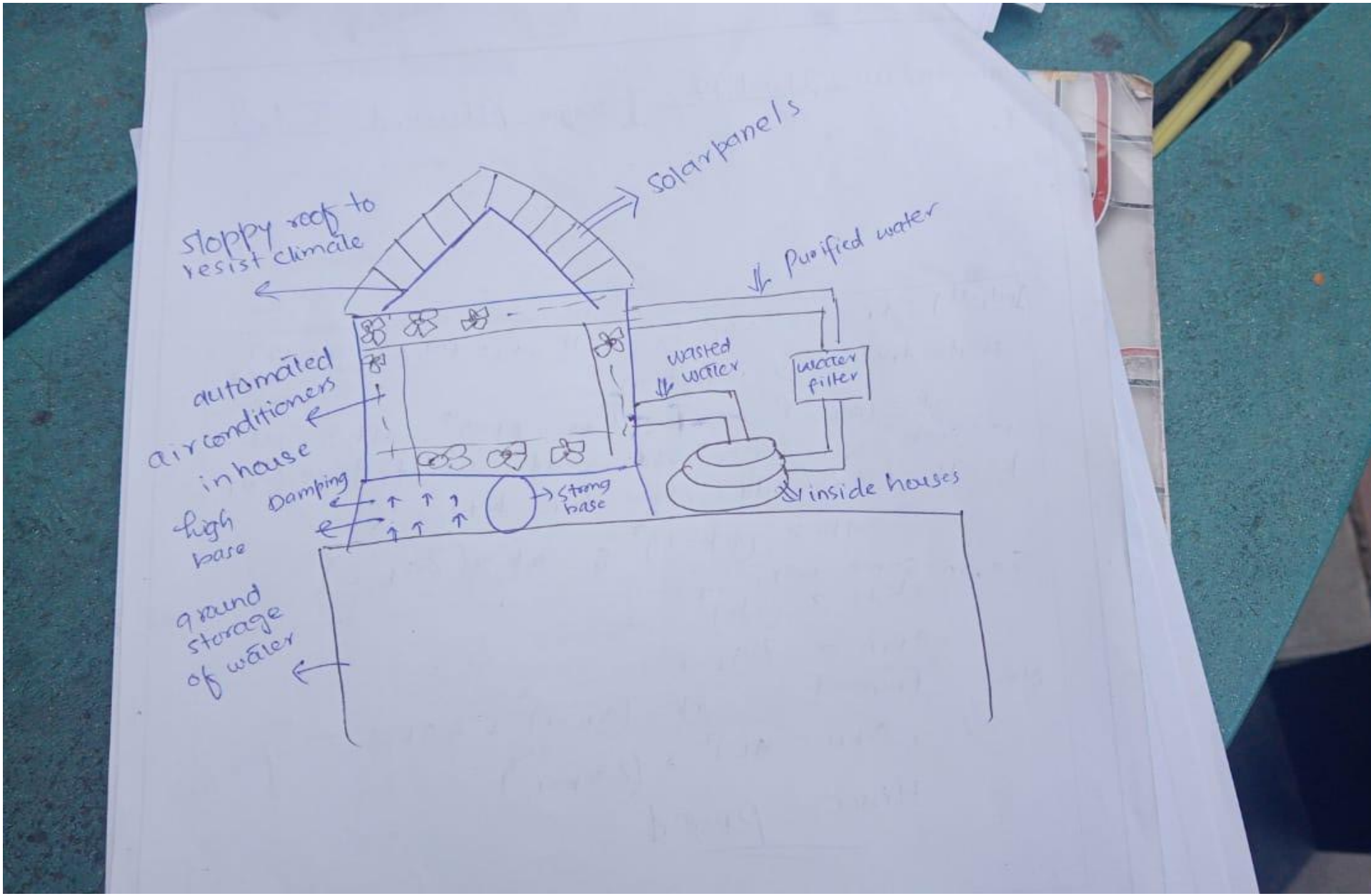


Energy Conservation:

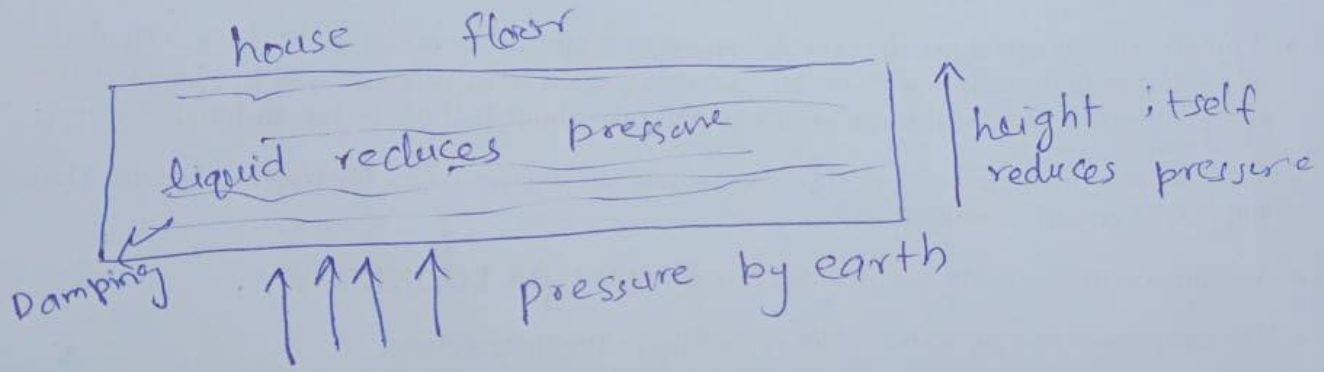
Solar panels should be inserted on the roof of every house or at least a street's 80 percent electricity should be produced by the residents themselves so that coal and water resources used to produce electricity could be preserved otherwise their depletion may lead to the depletion of the human race in Pakistan.
(Many countries including the UK and Japan are working on this plan but Pakistan still lags far behind).

Sketches:

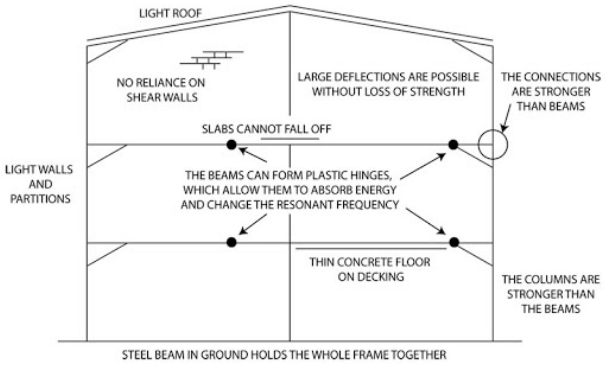
outside temperature
automated air conditioners
Temp set °C = 27°C
Set manually = set
set inside walls.


Solar panels
sloppy roof to resist climate
Purified water
automated air conditioners in house
wasted water
water filter
Damping
high base
strong base
inside houses
ground storage of water

Set inside walls.



SPECIAL MOMENT RESISTING FRAMES TO PREVENT EARTHQUAKE DAMAGE



STEEL BEAM IN GROUND HOLDS THE WHOLE FRAME TOGETHER

Design Analysis and reflection:

Shock absorbers work on the principle that they release fluid when they get a shock so that the effect of shock is minimized, the same principle is suggested by me for the damping in houses to be earthquake proof.

This design surely does not cover the economic problems in the country but this design is essential to be implemented otherwise climatic changes would bring different diseases.

Sloppy houses prevent climatic changes along with automated chillers.

My complete design contains a house with conservation , earthquake and climate resistant designs using daming, solar panels, water recycling plants, automated chillers, high and strong basis.

The public of Pakistan is very poor which adds as a limitation to my design as there are a lot of huts alongside rivers and roads which cannot surely does these and government is not able enough to implement this design all over the Pakistan but there could be different ways to implement this design which are out of my domain but this design would be economical once implemented as the cost of producing electricity would be reduced. Water storage costs would be reduced and losses with sudden changes will minimize which will add to the economy of Pakistan.

Scenarios:

Scenario 1:

It's December 2025. Ali the son of a rich businessman, rushes towards his dad saying dad! Do you know the gardener uncle is signing a contract with the government to convert his housing into a recyclable water system. Are we doing the same? The father laughs and says we don't need to do that. There is nothing going to happen with water. Use it freely. It is a gift from God and he is not gonna take it back so don't worry. Yes dad! You are right. Uncle is mad.

It's December 2030,

"Ali! Where are you?"

"Yes dad?"

"I am dying of thirst. There is no water in our house. Pump is unable to draw enough water form earth. Please rush towards the house of the gardener uncle and bring me some water. And sign a contract with the government immediately for a recyclable plant."

" Dad! I am sorry but the government has stopped this scheme because the underground water layer is very low and the government has stopped providing this scheme to those who wasted water in five years rather than saving it."

"I am sorry! I am ashamed of myself, my son! I am sorry!"

Scenario 2:

Mr. Ahmad is a shopkeeper sitting on the chair in evening in front of a friend named as Ashraf.

"Ashraf! I guess the day of judgement is about to come."

Ashraf laughs and asks how was so?

"Can't you see so many floods and storms and hail and the intensity in weathers like they will suck the life from the body?"

"Hmm I can see but it is not from nature. Rather, we have done this to nature."

"Whatever it is but the what can I do now? I have to save my house. It's in the best area of town but still is in danger"

"Did not you set the standard base of the house as per new policy to be safe against these climatic conditions?"

"NO!! What is it?"

"Come on! Do it now make your house a sloppy one and set its base according to the set level above the ground otherwise, you will be perished by such climatic severities and please fix some automated chillers inside the wall of your house to relax at every temperature outside your house."

"Oh! Thank you I will certainly do that. By the way when are you going abroad and when will you come back?"

"Going tomorrow and will be back after two years, Bye."

After two years, on the same table Ashraf exclaims that the map of Pakistan has been changed, housing design is modified and temperature and climatic changes are well-adjusted inside houses. They feel like mini paradises now.
“Yes, you are right. I really thank you for suggesting these things two years before otherwise my house could have been ruined by such sudden changes”

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