



Floating Houses

A Flood Surviving Mechanism

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The Central Provinces of Vietnam

Our Selected Region



- > 18 cities on a long coastline with a highly concentrated population
- > 30.76 million people – 31.62% of the Vietnam population
- > 150,288 km² – 45.38% of the country area

Problem Statement



Background

- Globally 70 million people are exposed to flood risk each year.
- Vietnam is one of the most disaster-prone countries in the world.
- Approximately 70% of the Vietnamese population is exposed to the risk of flooding.
- Central Vietnam has endured approximately 70% of flood damage over the past 20 years.



What Are Floods?

- An overflow of water that submerges land that is usually dry.
- Common causes: heavy rainfall, accelerated snowmelt, tsunamis (in coastal areas), storm surges from tropical cyclones.
- The most frequent type of natural disasters.
- The most widespread of all weather-related natural disasters.



Where Do Floods Occur?

- Areas prone to flooding: coastal areas and river flood plains.
- May occur in other areas due to unusual heavy rainfall for long periods of time.



Causes of Floods?

- Most floods are caused by excessive rainfall, overflowing rivers, storm surges, tsunamis, broken dams, channels with steep banks, snow/ice melt, insufficient vegetation.



Types of Floods

- Coastal
- River
- Storm surges
- Inland flooding
- Flash floods



General Impact of Floods

- Loss of life
- Property damage
- Economic impacts
- Psychosocial impacts

A vulnerable area which is highly exposed to all types of floods, not once but three to four times a year.

Economic Loss



Damage of Infrastructure



Human & Psychosocial Impact



Impacts of Floods in Vietnam

Some Flood Statistics in Vietnam:

- 2020: heavy rains caused severe flooding in 8 provinces. 511,172 houses submerged; 3,429 collapsed houses; 333,084 damages houses/roofs blown away; 291 fatalities; 66 missing people.
- 2017: Typhoon Damrey caused catastrophic floods causing damage of US\$630,5 million; more than 100 fatalities.
- 2016: severe floods due to heavy rains 5 provinces. Affected 500,000 people; damaged 100,000 houses.

Proof of Research



Mrs. Thi Ngo Hoang – 67-year-old citizen from Nghe An city
"The water level rose 1 meter in only half an hour. I did not have time to bring anything with me to get to a higher ground. Now, I've lost everything."



Ms. Ly Nguyen – Ba Don town, Quang Binh Province
"The Flood water has broken the front wall of my house and swept away all of my house facilities. When the water approached, I called my relatives to inform them of my possible death. I am still scared because it was horrible."



Mr. Quoc Thang Tran – President of the People Committee of Quang Dien province
"The most urgent priority now is to ensure food and water for innocent people and also to help them re-structure their damaged houses, and provide financial support for post-disaster recovery."

Solution Development

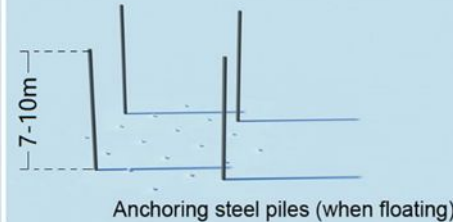
The Floating House



1

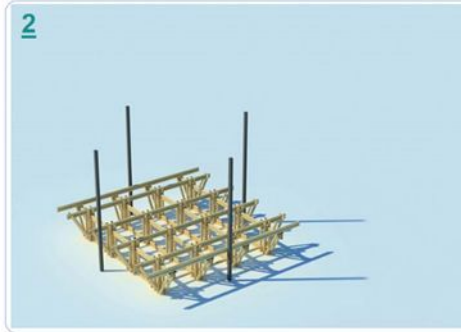
This disaster-proof shelter is attached to four anchoring steel piles which fix the whole structure into one place. These anchoring steel piles can be seven- to ten-metre long depending on the locations.

1



Anchoring steel piles (when floating)

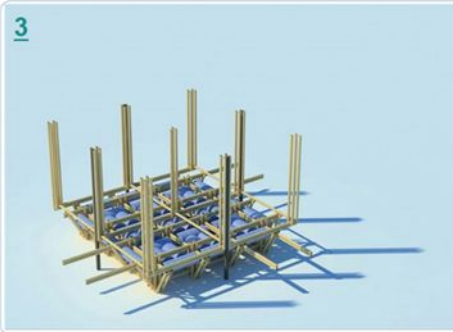
2



3

Multiple empty plastic barrels will be tied up underneath the ground floor. These recycled tanks are easily accessible and cost-effective

3



4



2

Next, the base of the house will be built, and this creates the ground floor. The floor dimension is 5m x 6m which will cover a total space of 30 square metres.

4

The walls and the roof are constructed using galvanised metal sheets. Like the recycled barrels, this type of construction material is available everywhere and inexpensive in Vietnam.

Feasibility Study



Economic aspect



- ❑ Cost: US\$1300 – US\$1500, including material cost and labour cost
- ❑ Building time estimation: 3-5 working days with 3 skilled workers
- ❑ Design: Straightforward, easy to follow and manageable for experienced workers, no architect required

Sustainability aspect



- ❑ Environmentally friendly
- ❑ Long lasting lifespan: for up to 25 years
- ❑ Applicable worldwide, especially in developing countries
- ❑ Low-cost and simple-design

Resilience aspect



- ❑ A solid disaster-proof shelter during hazardous weathers
- ❑ Pre-stocked humanitarian essentials (water, foods, medicines, sanitation products)
- ❑ Enhance disaster resilience at a family-level community

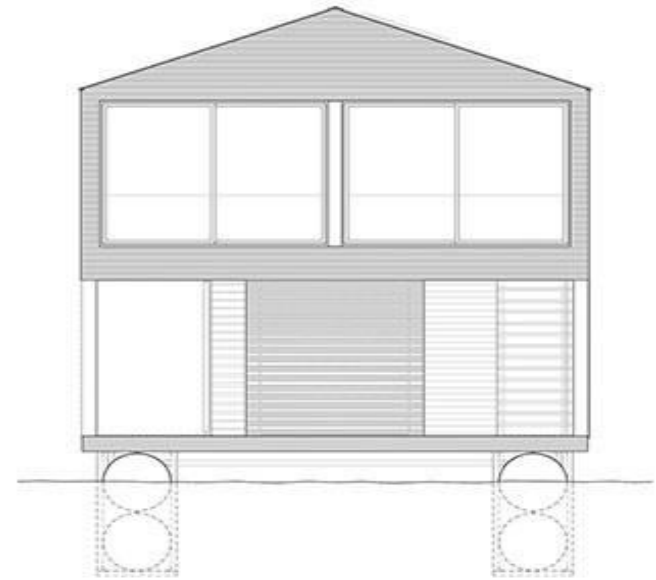


Implementation

	30 sqm house	50 sqm house
Cost (US\$)*	1500	2200
Number of people	6	10
Lifespan (years)	25	25
Building time (days)	3-5	5-7

*Costs are subjected to 20 percent off if mass production takes place

This floating houses strategy falls under the preparedness stage within the disaster management cycle.





Duc



Pauline



Jesse



Oluwadamilola

"A house is made of bricks and beams.
A home is made of hopes and dreams."

THANK YOU 🙏

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