

BALANGHAI

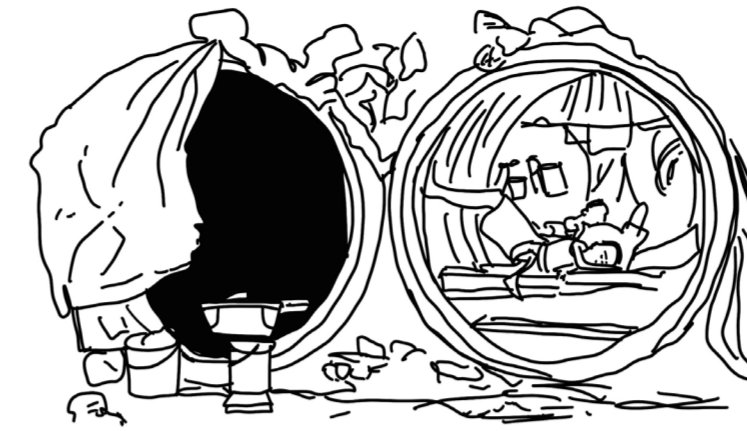
CHELSEA QUIZON

Weather and displaced families

The Philippines is an archipelago in Southeast Asia consisting of more than seven thousand islands. These islands are mountainous and seismically active. The weather conditions in the Philippines are tropical and monsoonal. The country is prone to catastrophic weather conditions. The most common one is **typhoons**. Every year, Filipinos suffer from devastating effects of super typhoons. The proposal aims to investigate ways of building **resilient housing** that is targeted to **low-income families** therefore affordable.



typhoon aftermath



family sleeping inside concrete pipe



overcrowded shelter

Design Proposal

This project explores traditional building techniques reinforced using **sustainable and eco-friendly** alternative materials that are local to the Philippines such as bamboo, coconut lumber and rice husks. The design intends to preserve Filipino practices by creating a **sense of community** providing amenities such as flexible open spaces to use for a marketplace and community gatherings, and a vertical garden, allows low-income families to access affordable healthy foods whilst generating income.



unsanitary wet markets



floating markets



community gardens

Site Detail

Tondo is a district located in Manila. Because of the dense population in Tondo, the proposal explores the possibility of building new settlements on the surrounding estuary, **Estero de Vitas**. This body of water connects to the Manila Harbour Port going to Manila Bay. The estuary is both polluted and underdeveloped due to nearby factories and improper disposal of waste.



Estero de Vitas



Map of Tondo

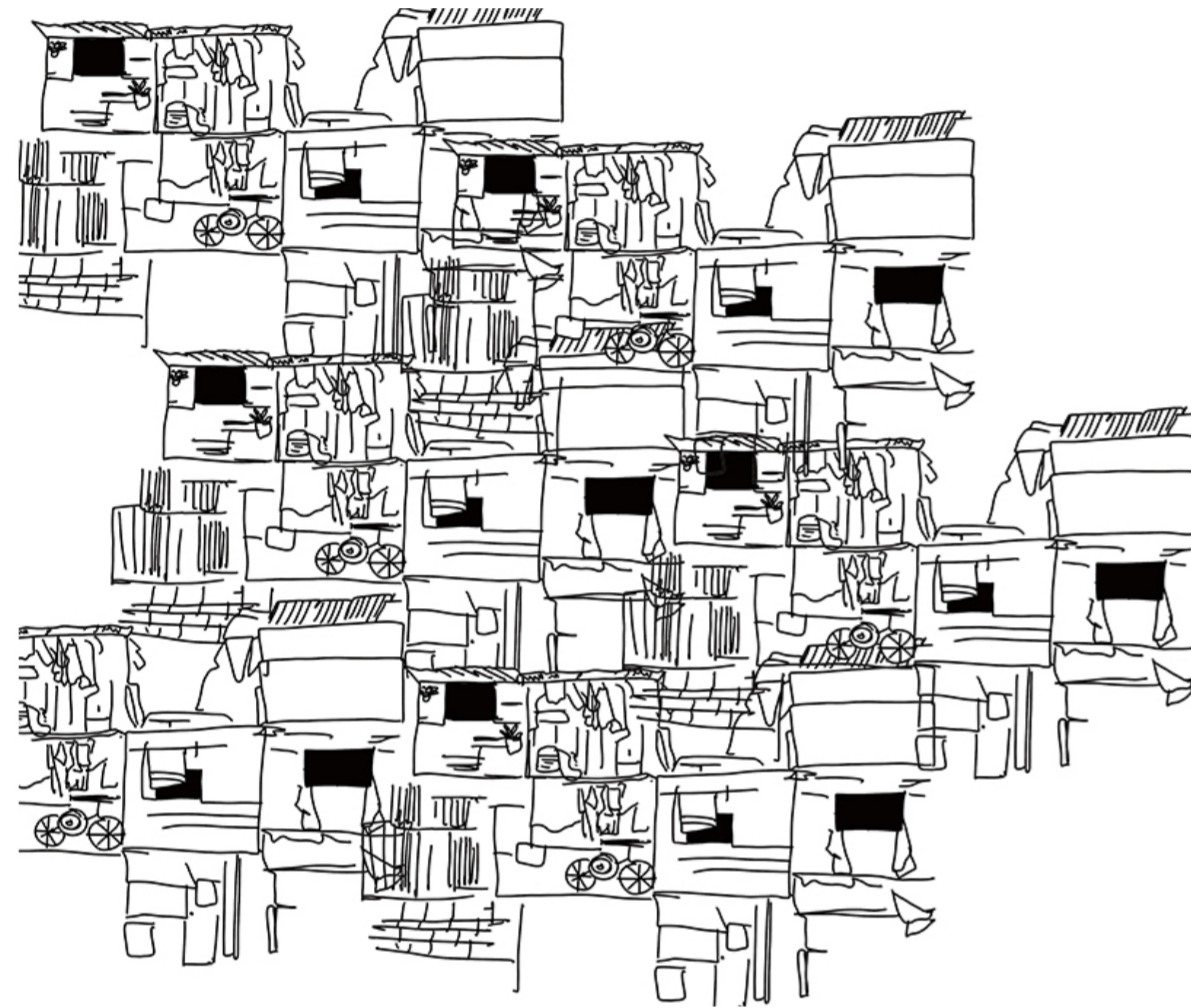


Manila

CONTEXTUALLY RESILIENT HOUSING CONSIDERATIONS

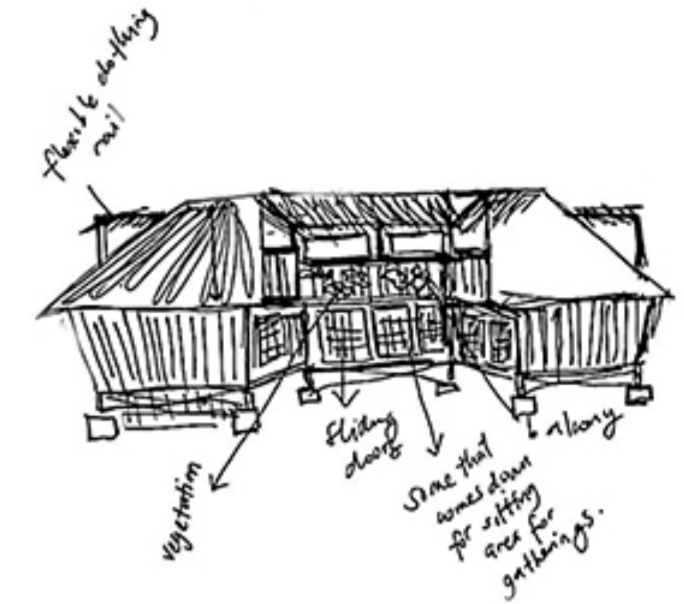
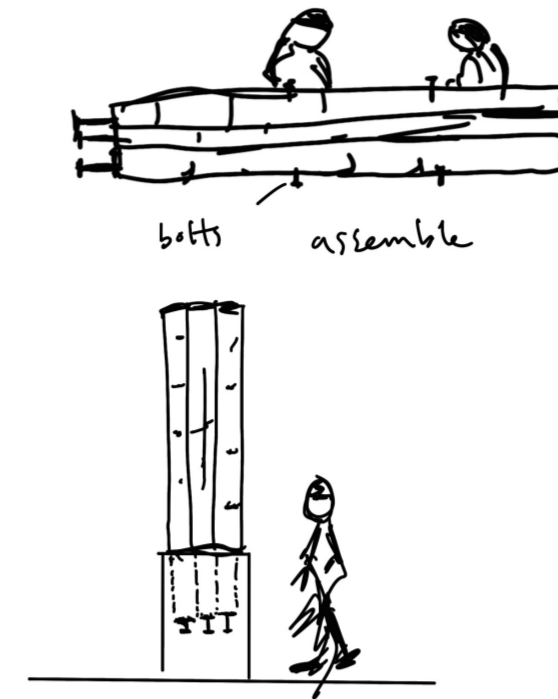
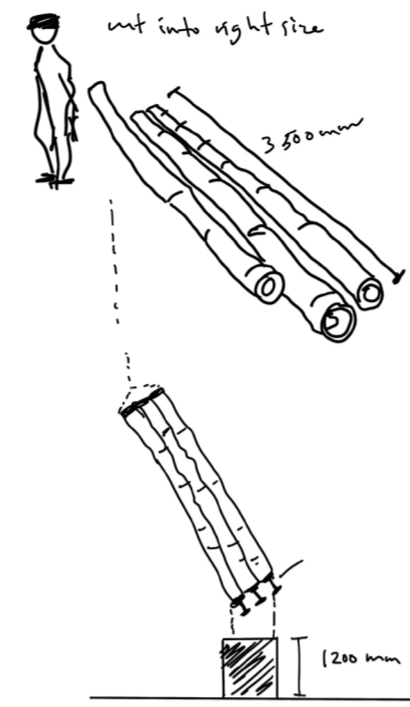
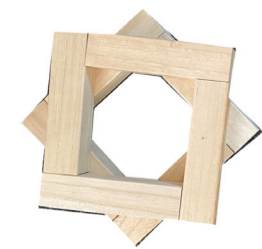
Makeshift homes are seen in slum areas. They are settlement units almost stacked together due to overpopulation and

the need for more space to accommodate the needs of a family.



Jenga blocks exploration informed by the clustering of settlements in Tondo. The structure explores diverse

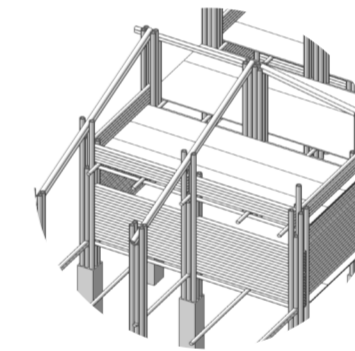
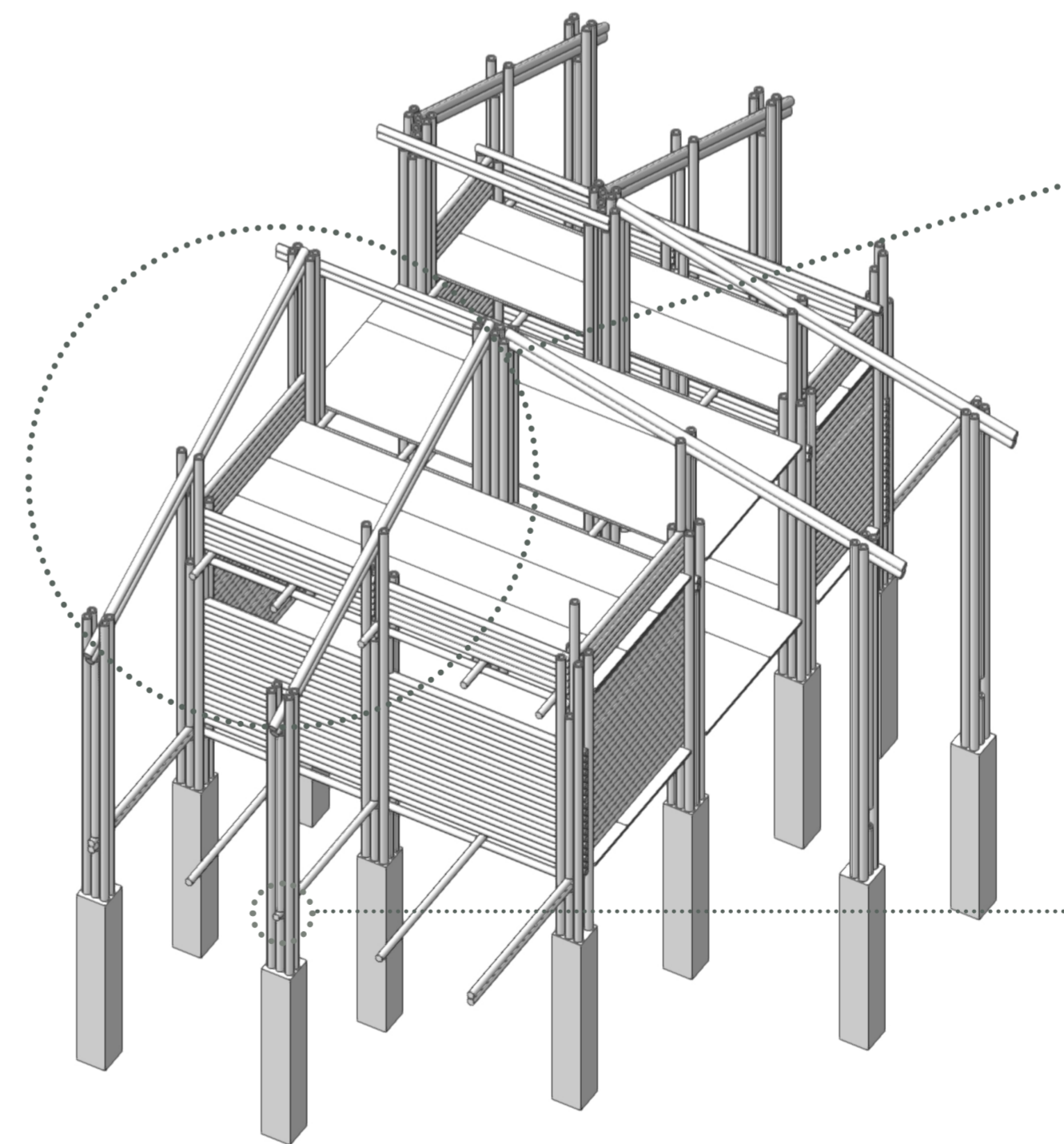
ways of incorporating daily Filipino activities such as private mealtimes and community gatherings.



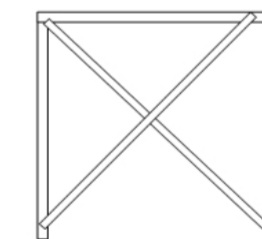
Clusters of bamboo are put together using a combination of bolts and traditional tying methods.

Steel plates attached to bamboo before inserted in concrete to prevent it from rotting in events of flood.

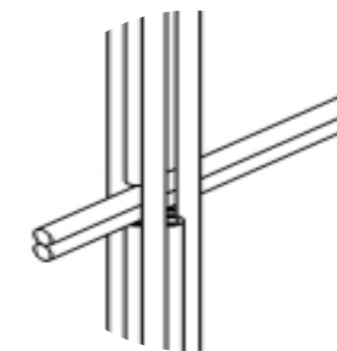
Flexible design considerations such as walls that come up that doubles as clothing rail when hanging clothes.



Sloped roof to improve aerodynamics



Cross-bracing bamboo adds robustness to the structure



Bamboo slotted against each other to strengthen the structure

THREE LEVELS OF ACCOMMODATION

Second Level- Sleeping Quarters

Key areas

- 1 flexible are/sleeping quarters
- 2 folding down walls leading to private balcony

First Level- Living Units

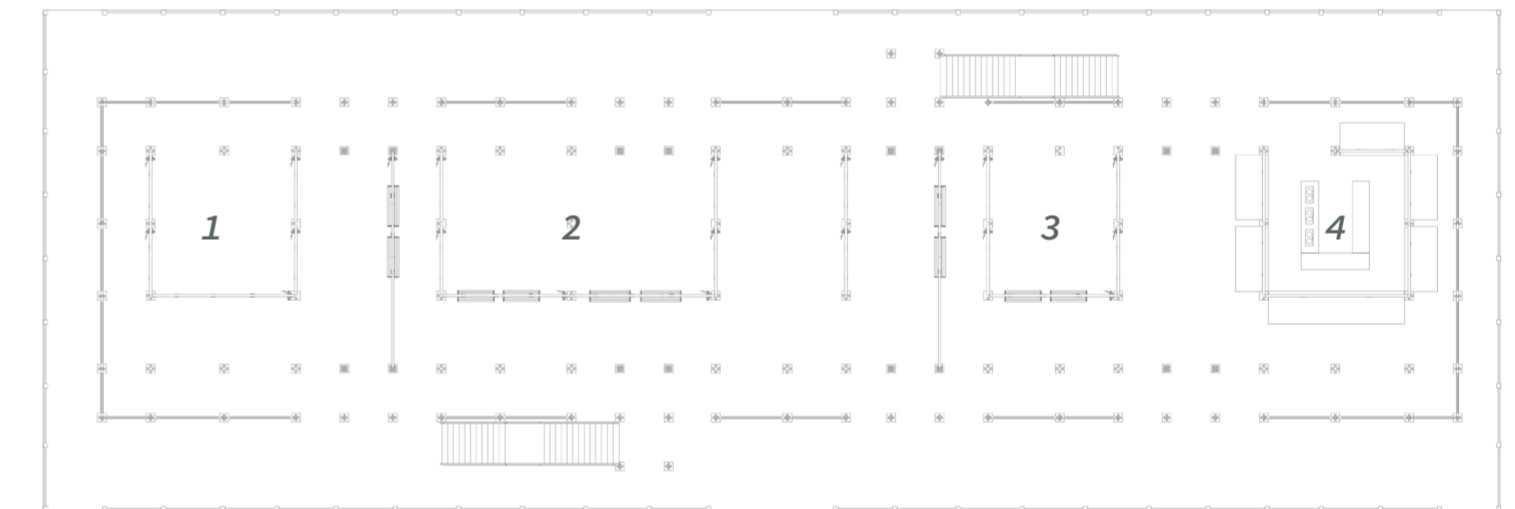
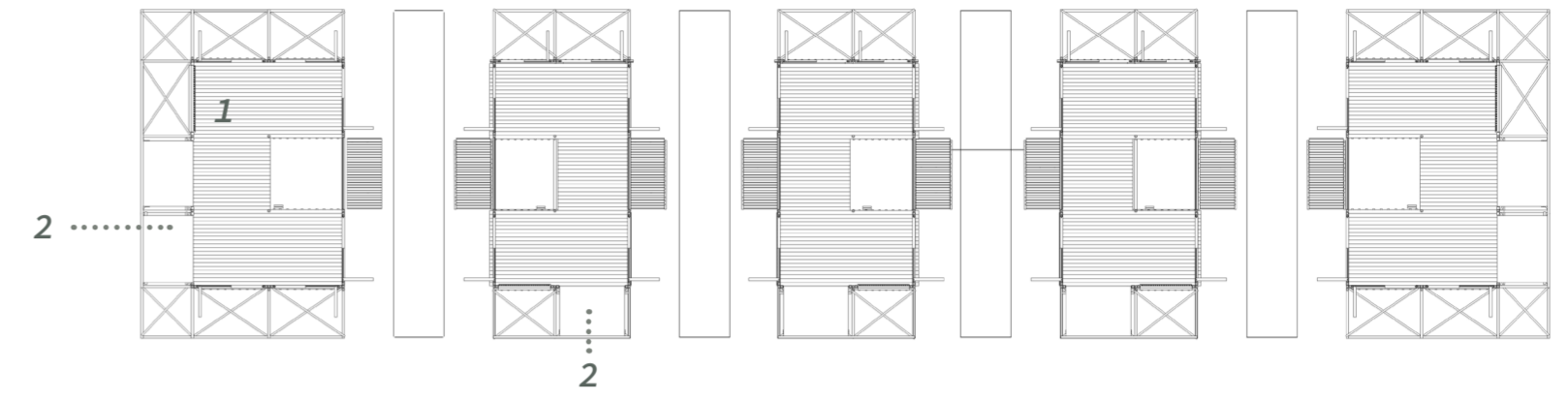
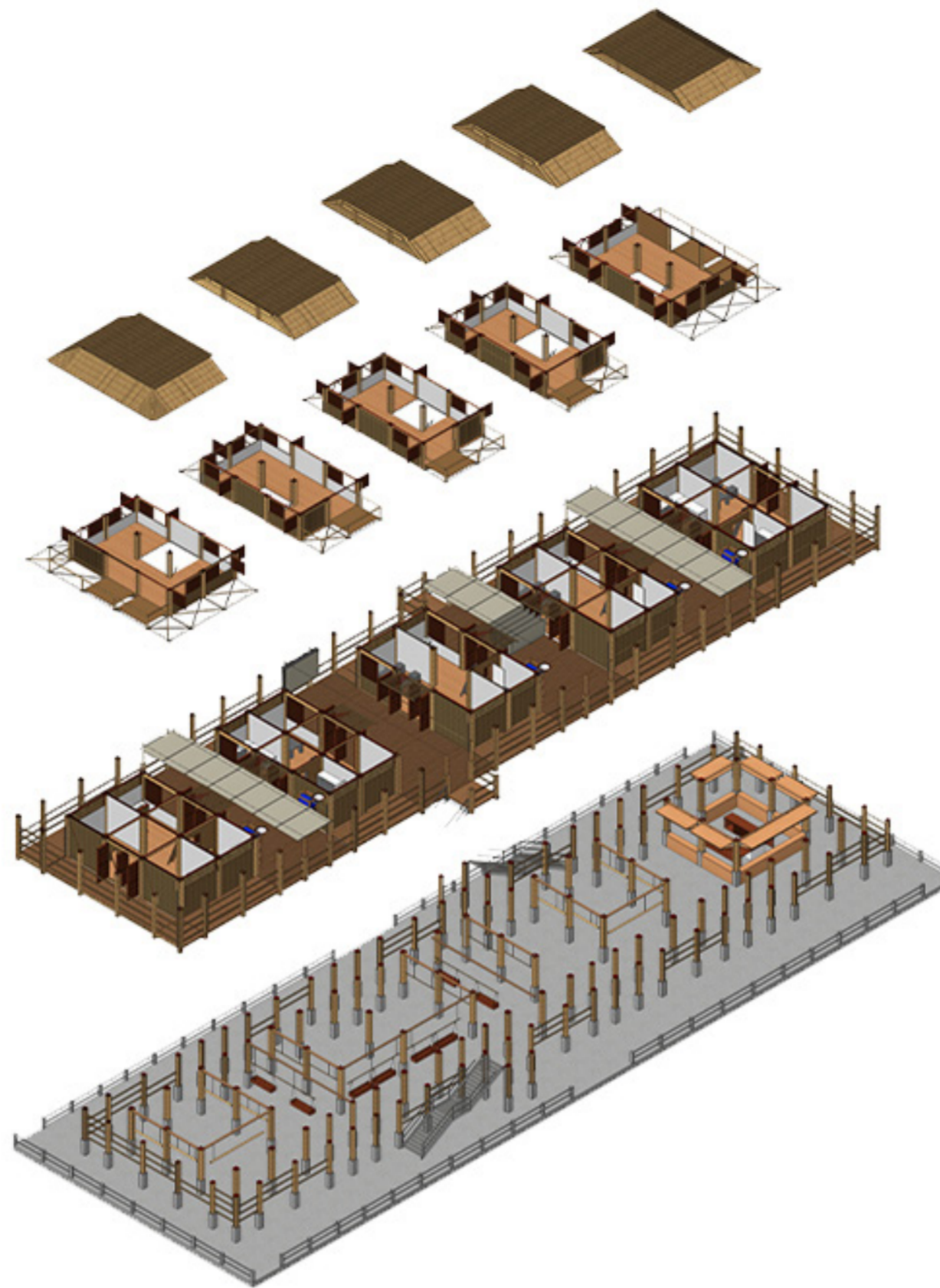
Key areas

- 1 walkway
- 2 slide wire canopy
- 3 stairs leading down to marketplace
- 4 rainwater collection system
- 5 Vertical Garden

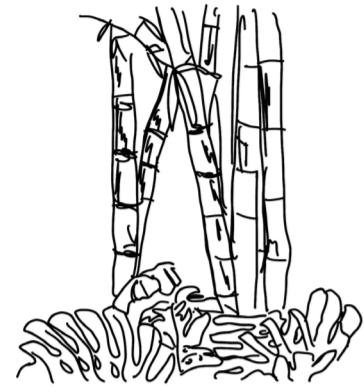
Ground Level- Marketplace

Key areas

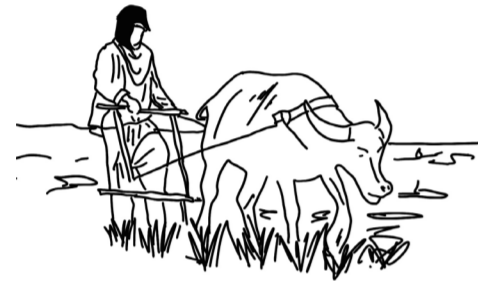
- 1 Fish section
- 2 Fruits
- 3 Vegetable
- 4 Carinderia (Eatery)



LOCAL MATERIALS AND PROJECT MATERIALITY



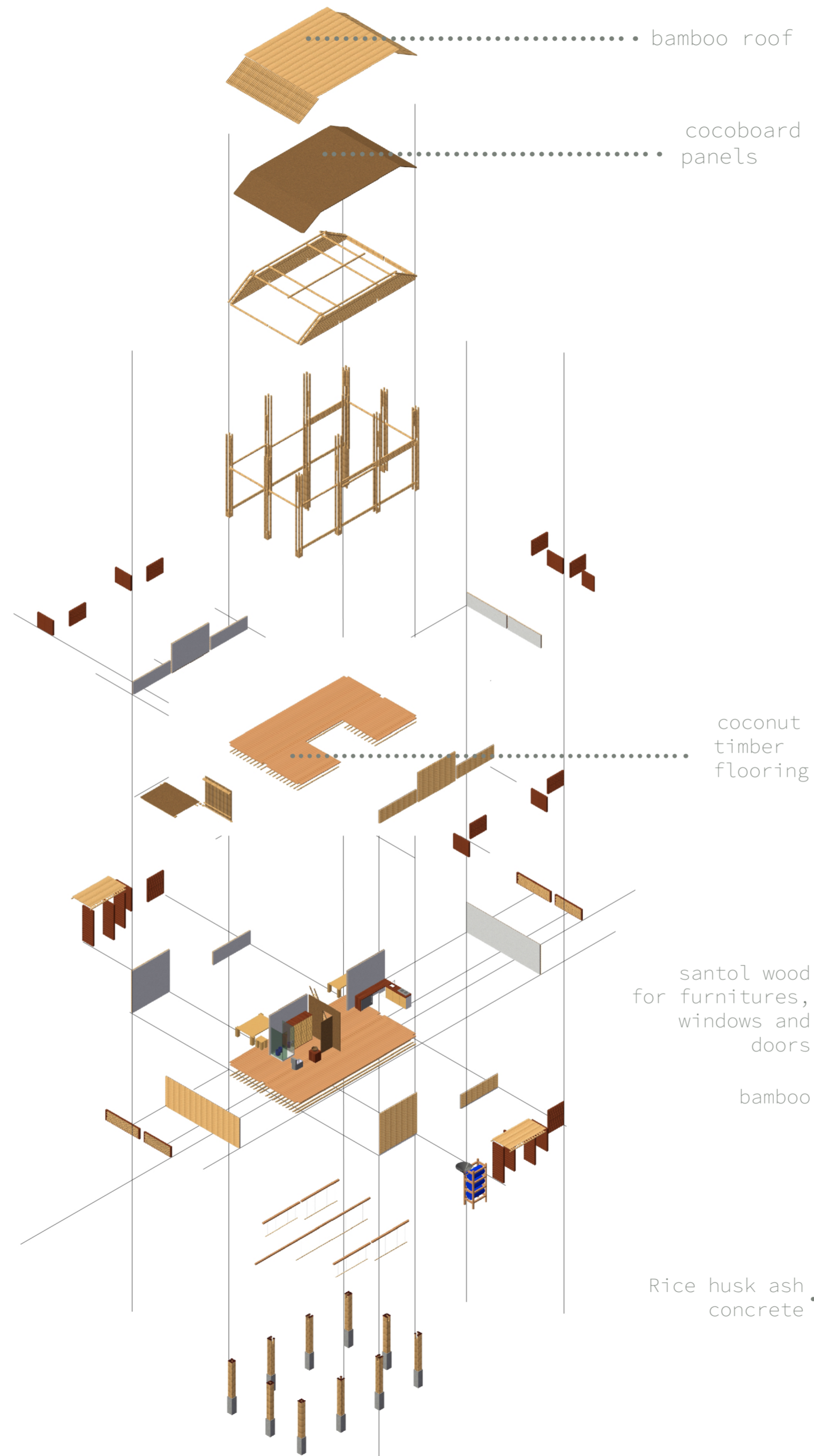
Bamboo. The country is rich in these fast-growing perennials. The Philippines has over 60 species of bamboo only 20 are native to the country. It is known for light weight and high tensile properties.



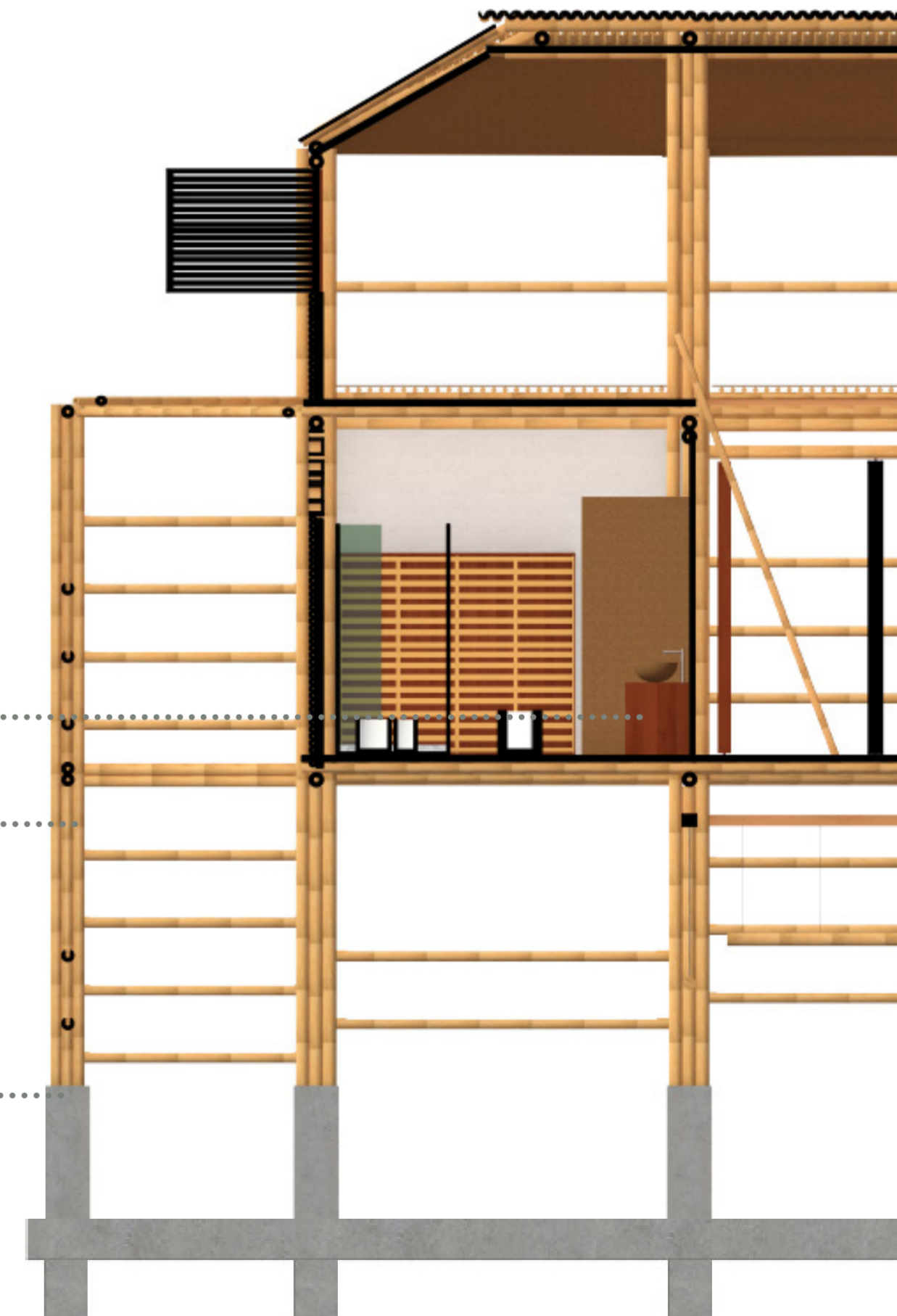
Rice Husk ash is a by-product of the combustion of rice hulls. It has high absorbent and insulating properties that are added as strengthening agent to building materials.



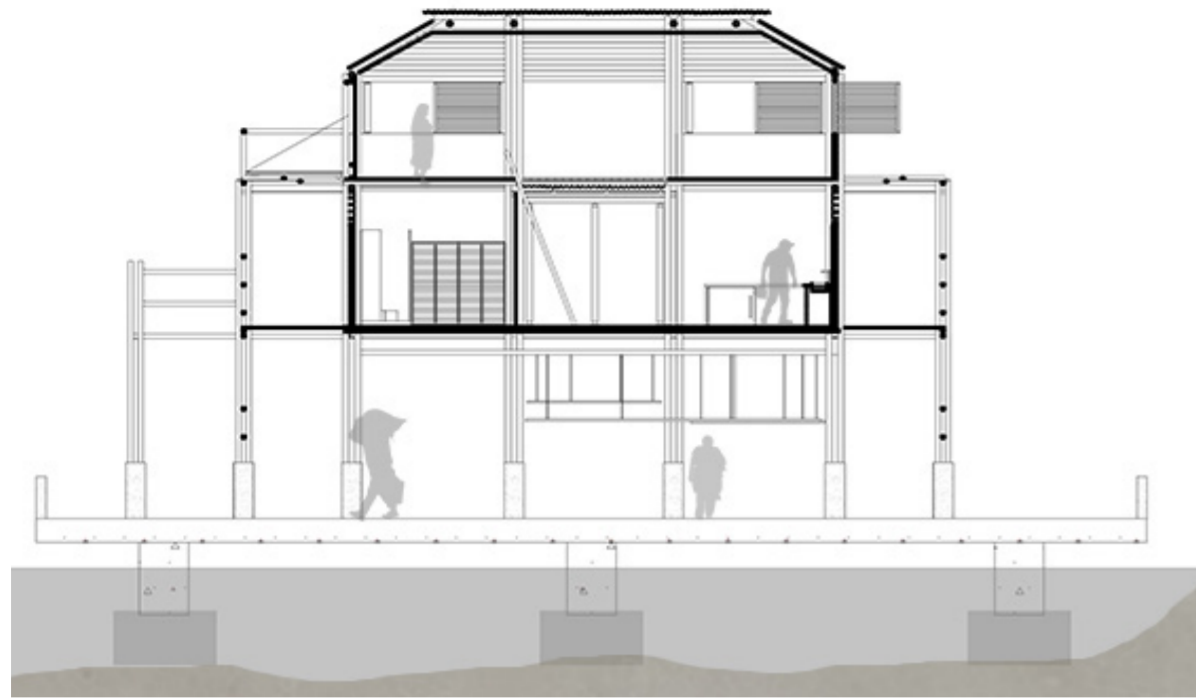
Coconut husks used to be waste but are now processed to become a sustainable building material. Cocoboards are used for wall panelling and cladding. Older coconut trees are cut down, made into lumber and replaced.



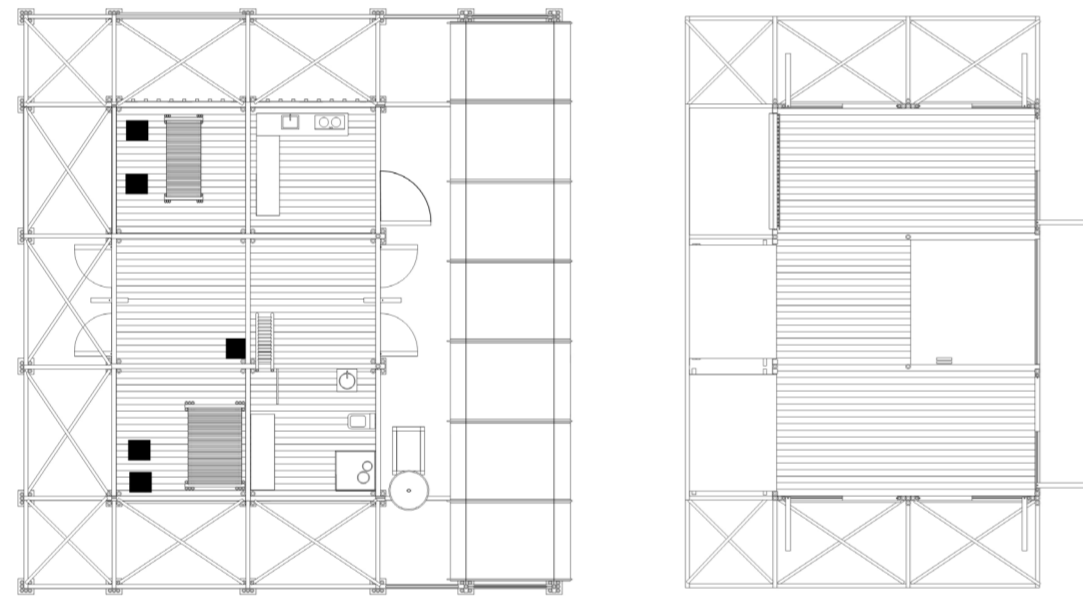
-  Santol wood is sustainable wood alternative that is dense and easy to work with.
-  Coconut timber is a hardwood alternative from coconut palm trees.
-  Rice husk ash sustainable material for concrete.



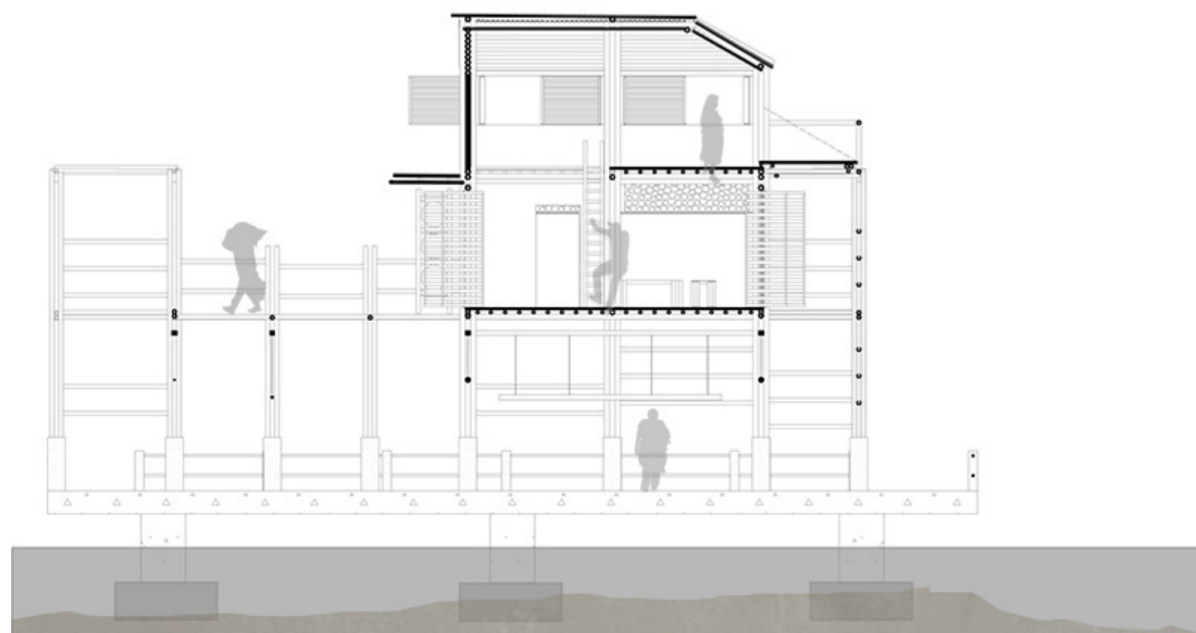
PERSPECTIVE VIEWS



Section view looking at multi-functional space



House type B first and second floor plan



Section view looking at walkway to housing unit



View from walkway and vertical garden



View inside living unit looking at multi-purpose space



View looking at the marketplace