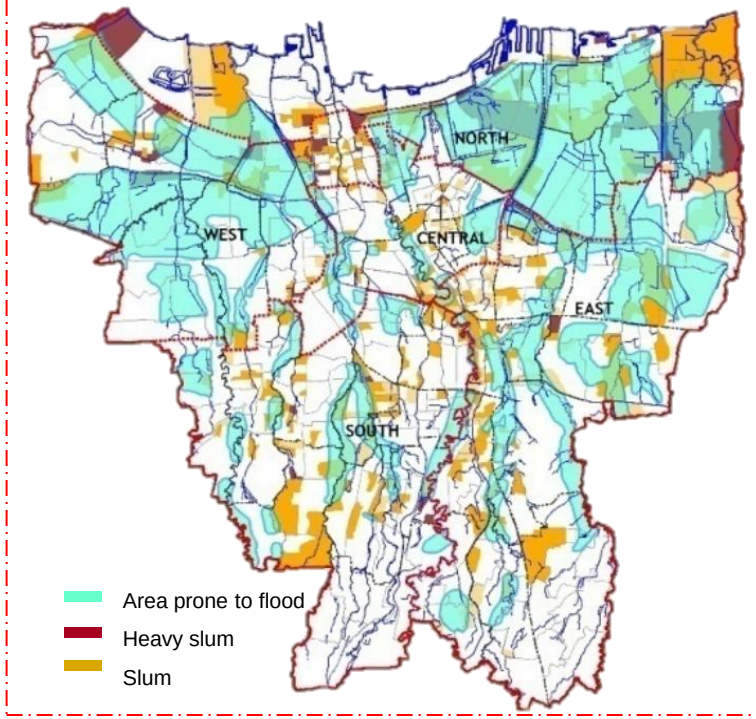


Population

Jakarta is the largest city in the Indonesian archipelago and the economic, cultural and political centre of Java.

Land area – 662km2

Population(2011) – 10,187,595

Population density – 15,342/km2

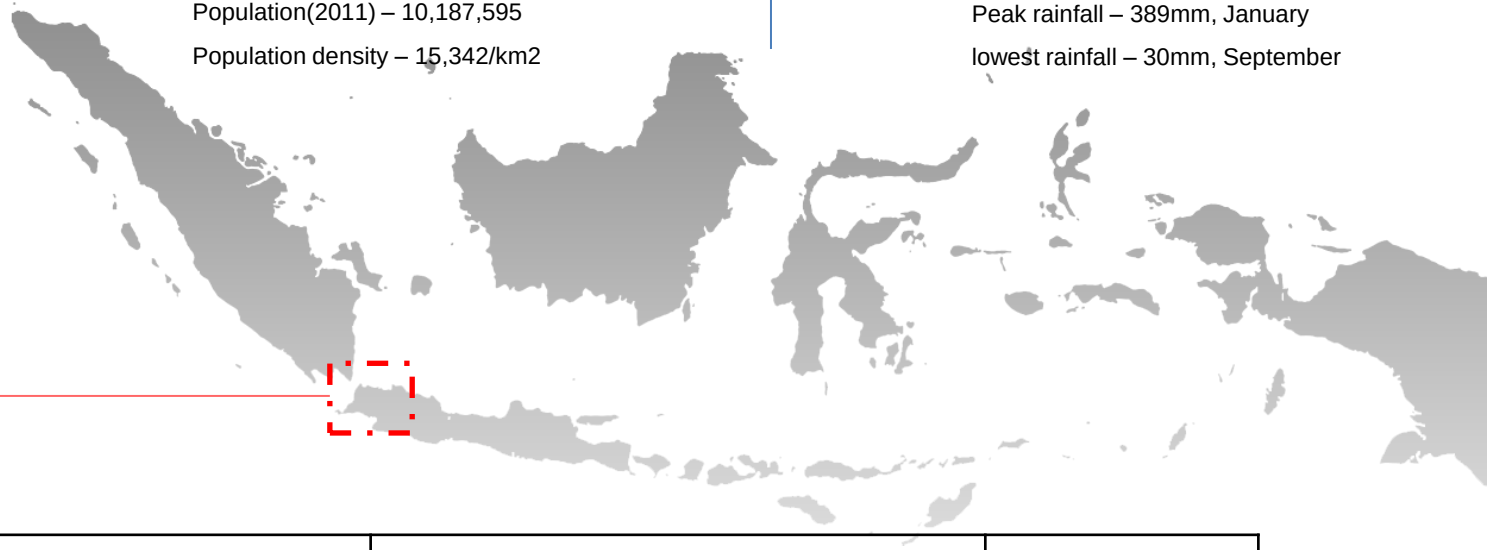
Climate

The city is located relatively close to the equator with both wet & dry seasons.

Temperatures ranging from 24-34*c.

Peak rainfall – 389mm, January

lowest rainfall – 30mm, September



Name of the students: John Monahan Ann McGrath Patrick Brennan Christopher Irvine Mark Devlin	**University:** Queens University, Belfast	**Name of the supervisor:** Mr Jason Von Meding	**6th i-Rec student competition**
	Department: School of Planning, Architecture and Civil Engineering		
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Telephone number: 028 9097 4006			**Date:** 25th March 2013

Location

Jakarta is located on a delta containing 13 natural rivers and over 1400 man-made waterways. The city includes scattered areas of Poverty residing in dense slum neighbourhoods with high population and informal economic activity.

5% of the population live in slums residing along waterways due to the accessibility to water, therefore increasing the exposure to risk and impact of flooding. Without sufficient piped water, wells are drilled to access groundwater, leading to divergence of the land and therefore increasing impact of flooding.

Infrastructure & Housing

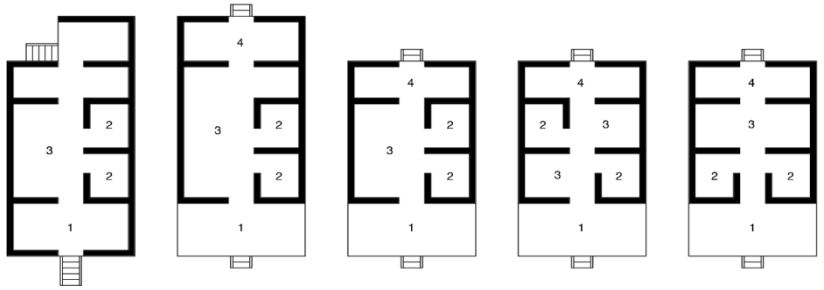
Massive requirements for improvements of housing are necessary to become resilient to impacts of flooding and drought for a growing population. Consistent in-migration of 250,000 a year has resulted in increasing housing demand. The expansion of settlements along rivers has led to increased levels of pollution and overcrowding.

Slum culture

Residents earn a living by collecting waste to sell. Their homes are generally constructed from salvaged materials that are unsuitable for dealing with the reoccurring flooding. Some inhabitants make a living from selling clean water that is inaccessible to the slum inhabitants. The clustered neighbourhoods involve close relationships between families for survival, but promotes dangerous, uncollected waste deposit, causing around 50,000 fatalities a year through disease.

Traditional living

The population of Jakarta is predominantly Muslim (85%), therefore the typical layout of a dwelling consists of a compartmented space for women, and open communal spaces for men including a veranda at the front of the house. In addition, the front of the house will usually look north or south.



1. Veranda 2. Bedroom 3. living area/ mother home 4.cooking area

Hazards

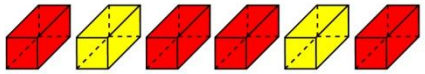
Flooding & Drought – property damage, groundwater pollution, solid waste flow, disease spread, death, insufficient water supplies, crop failure.

Recent downpours in Early 2013 have caused flooding originating from southern high ground and high tide in the north; resulting in 29 fatalities, 6,781 affected households and the displacement of 37,799 inhabitants. Thousands suffer diarrhoea, upper track respiratory infection and skin disease.

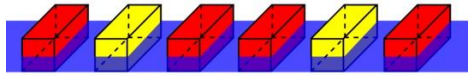
The whole city is at high risk to disaster, with few areas resilient to flooding.

Concept

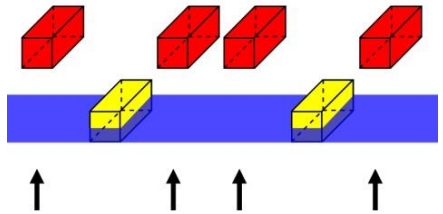
1 - Current



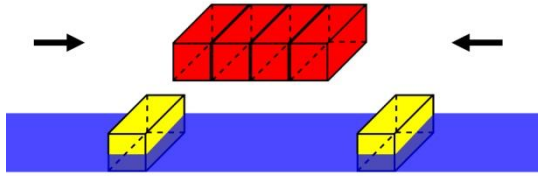
2 - Flood



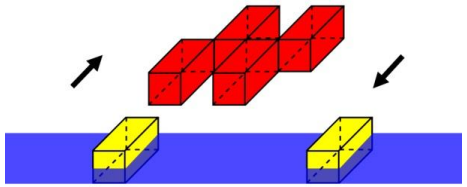
3 - Raise



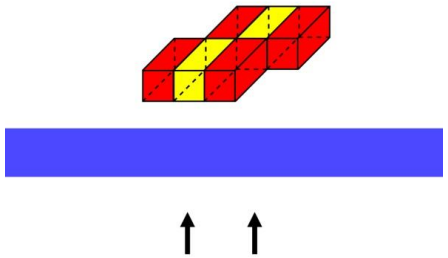
4 - Push



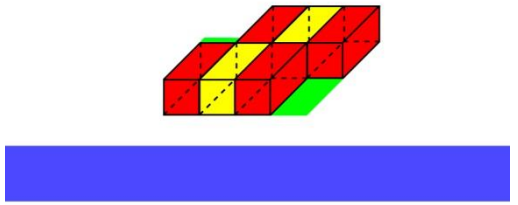
5 - Checker



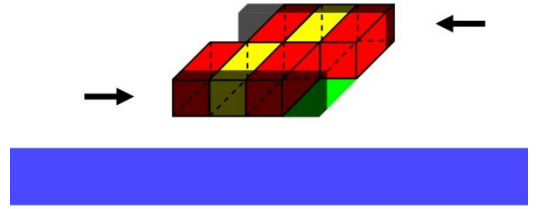
6 – Shacks - up



7 - Garden



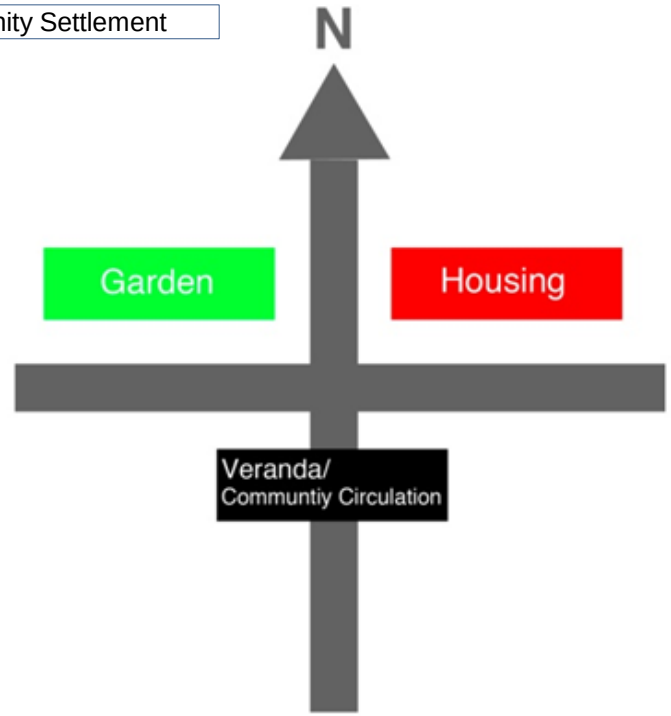
8 – Communal veranda



Our Approach

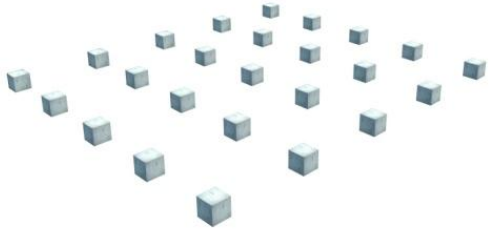
1. Keeping with the traditional layout of villages in Indonesia
2. Using the existing layout of houses in the slums. Having a mixture of existing/permanent houses, but also allowing space for development of temporary structures if needed.
3. Floods occur annually, both the permanent and temporary housing get destroyed. Finding a solution to implement housing that can withstand annual flooding
4. Designing a system that raises housing above the flood water level.
5. Bring the houses together to reduce the amount of structure and therefore the surface of the floodplain, which will be built on.
6. To create a better sense of community and again to reduce the floodplain construction, we propose to stagger the house to create a checkerboard effect.
7. This allows for temporary housing to be constructed along side permanent housing.
8. In addition, we propose to create communal gardens from which crops can be grow and create for more space for safe and interactive spaces.
9. To reduce circulation, we have opened up the houses veranda's and to proposed communal circulation space to allow daily interaction in the community
10. To provide a shaded street during topical season and to create space for local business and traders to avail of

Traditional Community Settlement

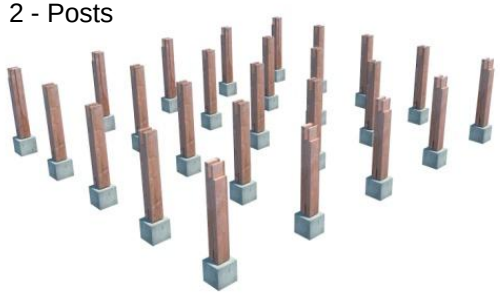


Construction Step by Step

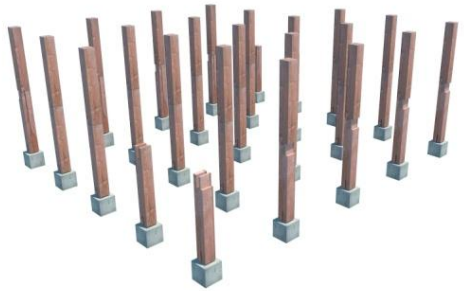
1 - Footings



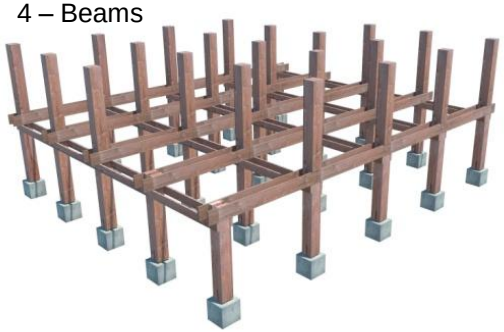
2 - Posts



3 – Extended Posts



4 – Beams



5 – Deck

6 – Truss

7 – Rail and Stairs

8 – Walls

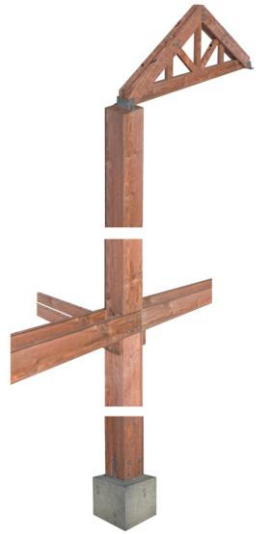
9 – Roof

Construction Details

1 – Foundation

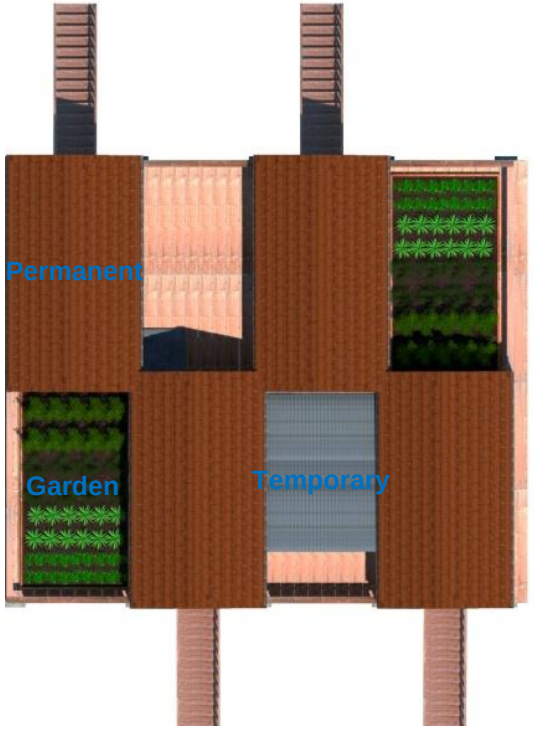
2 – Platform

3 – Truss



Plans

1 - Floor Plan



2 - Roof Plan

Elevations

3 - East Elevation

4 - North Elevation

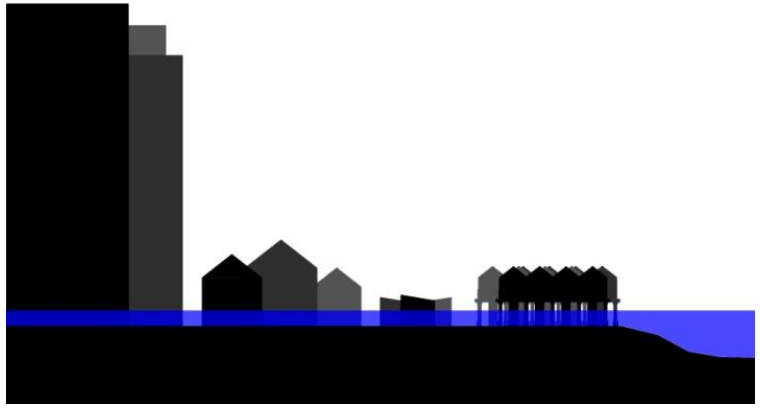
5 - South Elevation

Total Area of deck = 111.9 m ^{2}

Total area of foundations on flood plain = 5 m ^{2}

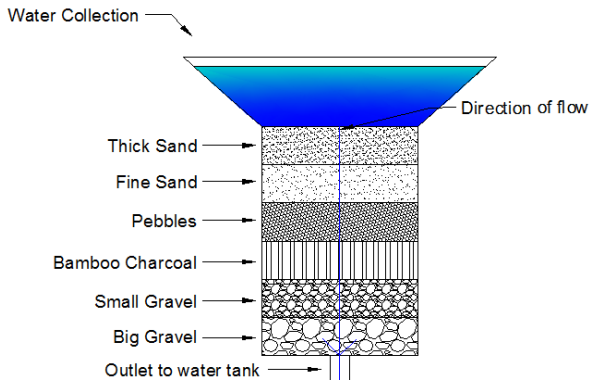
Total area of floodplain not build on = 106.9 m ^{2}

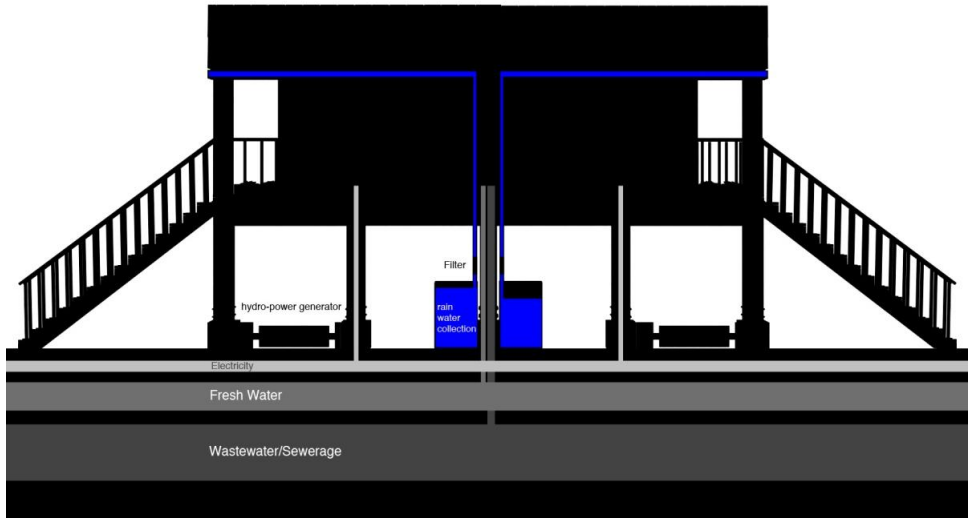
96% of floodplain saved = reduced surface runoff



Technological Approach

Water Filtration System



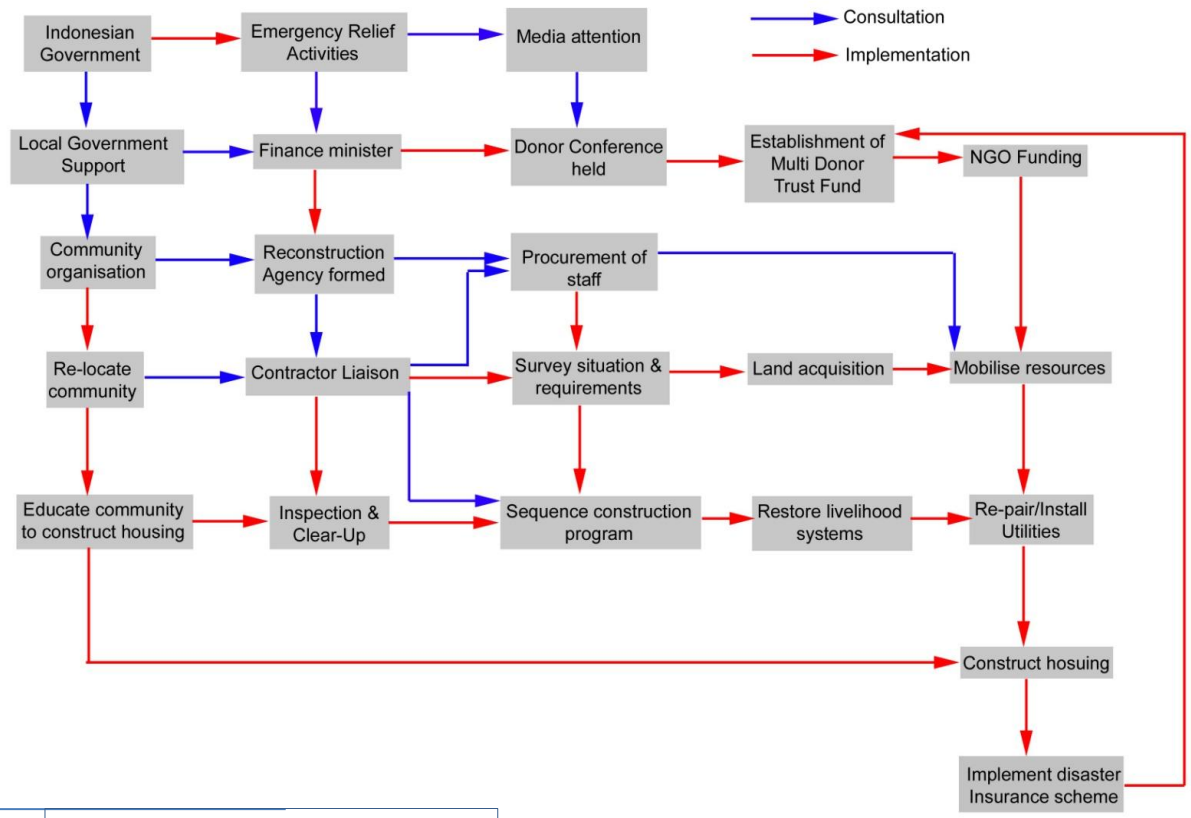


Hydro – Power Generator

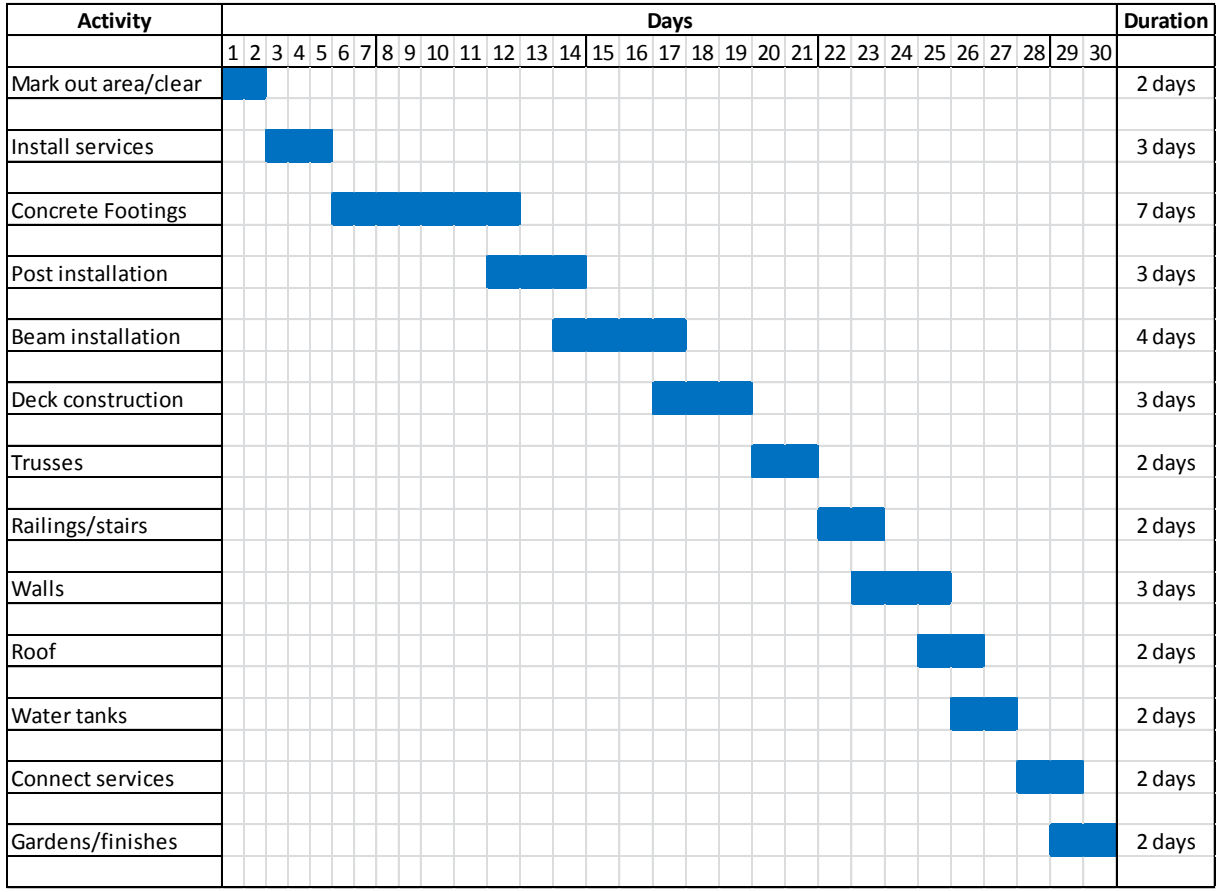
This project will adopt various innovative technologies. In order to provide clean water, the housing project will include a bamboo charcoal filter. The filter will be made of locally available materials including charred bamboo, gravel and natural adsorbents. The process we propose is indigenous, eco-friendly, low cost and entails minimum maintenance. The water will then be stored and available for use when required.

The housing project will also adopt a hydro - power generator. The generator will provide power when it rains and floods for basic lighting. The floating waterwheel will generate electricity from the flowing flood water regardless of depth.

Participants Flow Chart



Timeline



Construction Sequences

Short Term Goals	Long Term Goals
• To provide adequate self-sufficient housing that is protected from constant flooding	• To provide a self-sufficient community - Sanitary provisions, water storage and collection, vegetation and gardens
• Maintain the traditional construction techniques - Pitched Roofs and typical timber structure	• Integrate Payment scheme- long term these community will own their own land by paying an annual amount for the house
• Raise permanent housing above the flood water level	• To create a safer and co-ordinate street
• With the help of NGO's to reconstruct these type of housing with Architects, Project Managers and Contractors	• To provide space for commerce and businesses for the local community
• Attain finance, aid and resources from Local and International Government	• To provide training and development in the local community in constructing and survival techniques against further flooding
• Gain agreement and cooperation with Indonesian Government to allow a payment scheme for settlement of housing	• To allow space between the housing for further development for the local community

Aerial Perspective

3D Perspective

Space for Business and Trade underneath platform

Settlement