

The Tsunami Challenge

Brainstorm innovations in rebuilding communities in the Tsunami affected countries.

"A FRAMEWORK FOR MANAGING DESIGN" (Team GSD-1)
 A multi-pronged proposal ranging from dwelling cores to urban patterns, with focus on flexibility to adjust to culture. Includes income generation by attracting private sector through innovative marketing, and use of local materials. Ellen Chen, Eric Ho, Nour Jallad, Rick Lam, Ying Zhou; Harvard Graduate School of Design.

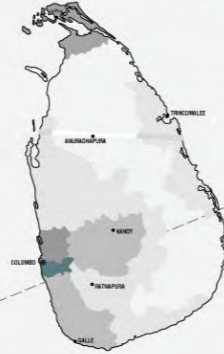
A workshop for MIT and the Cambridge community during Springbreak – March 2005

Hosted by SIGUS, School of Architecture and Planning, MIT - Dr. Reinhard Goethert in collaboration with Prof. Robert Cowherd Rhode Island School of Design

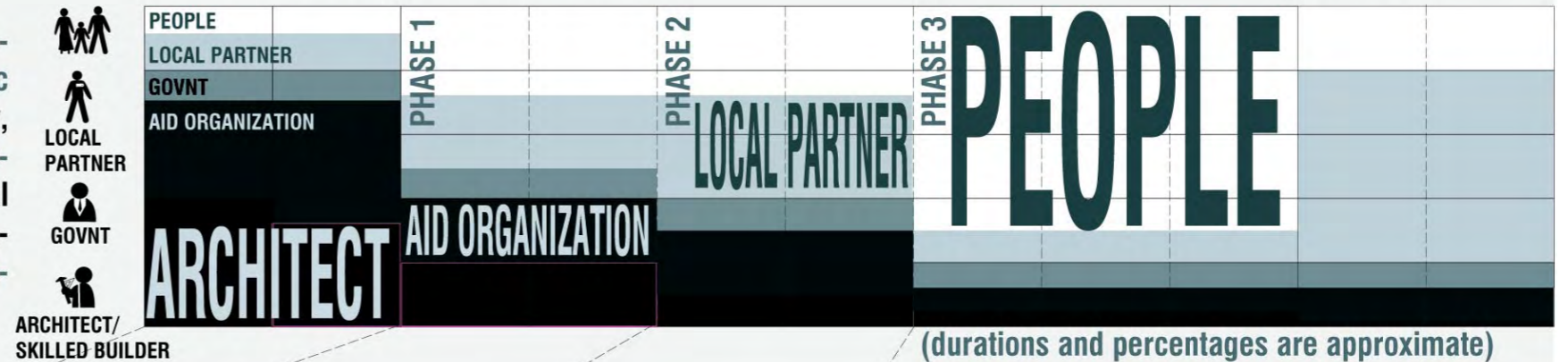
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CORE + Infill | Phasing

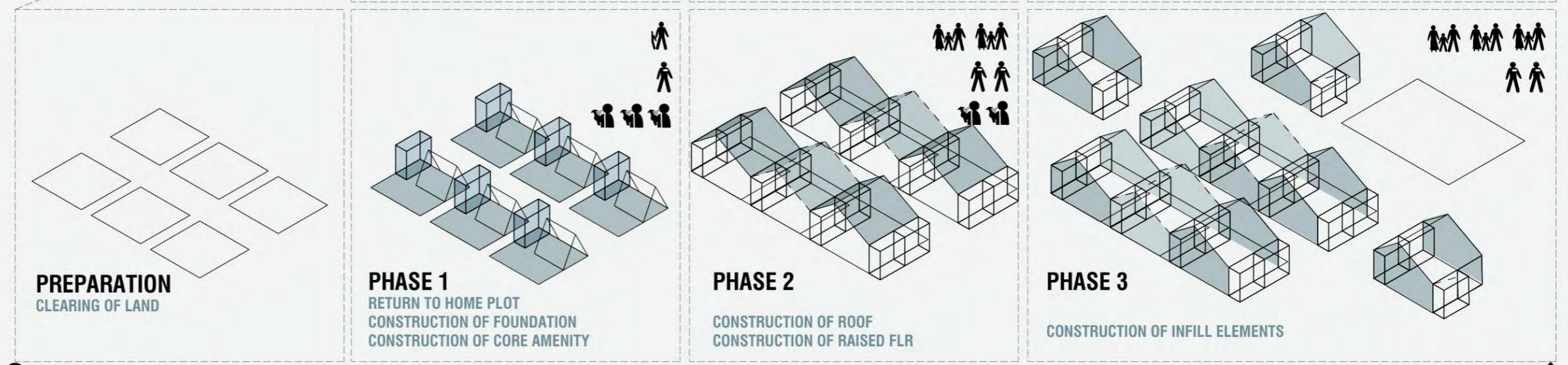
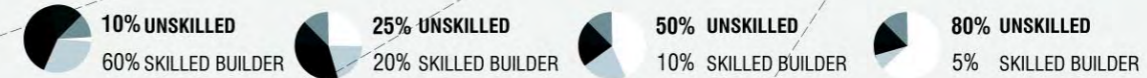
The parameters for the task in the devastated areas of Sri Lanka are the classic dimensions of sustainability: "economy, ecology and social sustainability" translating into low cost, disaster prevention, local technologies and materials, and participatory reconstruction in all stages of the project.



DESIGN PLANNING IMPLEMENTATION MONITORING



(durations and percentages are approximate)



IMPLEMENTATION

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WORKSHOP = community

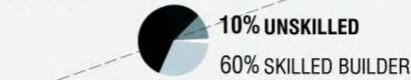
The workshops bring the community together and teach them how to build their homes. Helping the people help themselves is a longer-term sustainable goal, economically, ecologically and socially.



HOW TO BUILD YOUR HOUSE
 BUILDING MANUAL



ARCHITECT/
 SKILLED BUILDER



workshop 1

ARCHITECT + SKILLED LOCAL CRAFTSPERSONS + WORKSHOPS OF FAMILIES

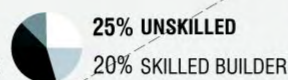


IMPLEMENTATION

DESIGN PLANNING → IMPLEMENTATION → MONITORING

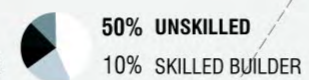


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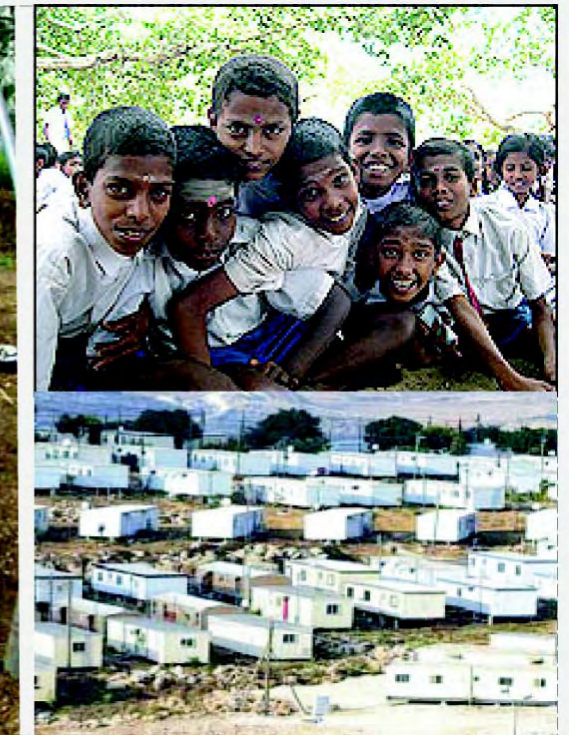
workshop 2

ARCHITECT + SKILLED LOCAL CRAFTSPERSONS + WORKSHOPS OF FAMILIES



workshop 3

LOCAL PARTNER SUBSIDIZING MATERIALS FOR INFILL ELEMENTS + WORKSHOPS OF FAMILIES



IMPLEMENTATION

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"PARTICIPATORY FRAMEWORK FOR THE ACEHNESE COMMUNITY" (Team MIT-1)

A reorganization structure to bridge the gap between the aid organizations and community priorities, balancing a planning section with monitoring section.

Rogelio Palomera-Arias, Sonia Parisca, Amanda Ikert, Manshi Low; MIT.

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Current Problems

- Funds are not being distributed
- Mismatch between conditional aid and communities' priorities
- Complicated distribution process
- Projects are being stalled



Current Situation

- NGO and government response
 - Top down
 - Bureaucratic
 - No community decision-making
- Community response
 - Independent of NGO and government
 - Fragmented use of information and resources
 - Reconstitution of social networks

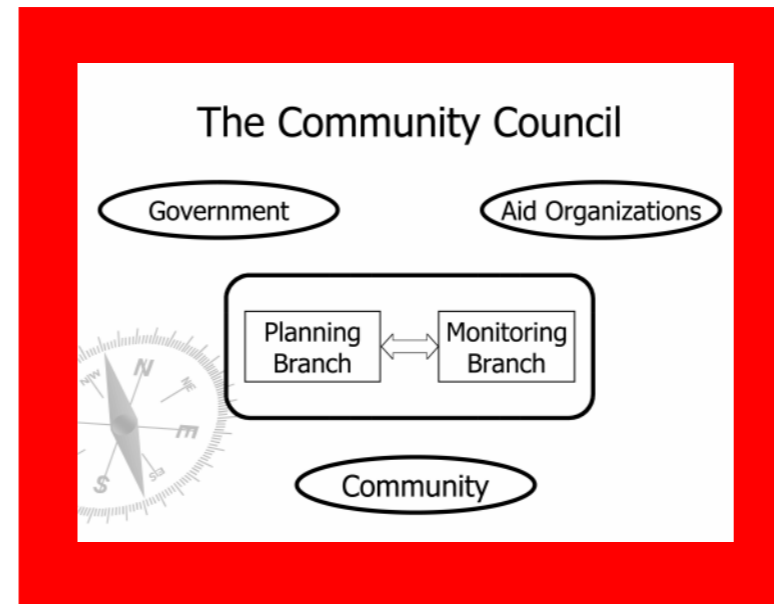


Our Solution

To create a **cooperative forum** to establish a key role for the local community in the planning process, while addressing concerns about accountability. This forum is formed through a local NGO as a **two-part community council** with **planning** and **monitoring** branches.

Planning Branch

- Composition
 - **Keciek** - Village head
 - **Imam** - Religious representative
 - **Ibu Arisan** - Leader of women's savings club
 - **Lorong** representatives
- Roles
 - Determine need priorities
 - Identify resources with local NGO help
 - Locate project partners/donors
 - Manage projects



Monitoring Branch

- Composition
 - Civic roles models identified by planning branch
 - Government representatives
 - NGO representatives determined by project
- Roles
 - Assess the project operations
 - Ensures aid organizations' missions are accomplished
 - Oversees proper use of funding



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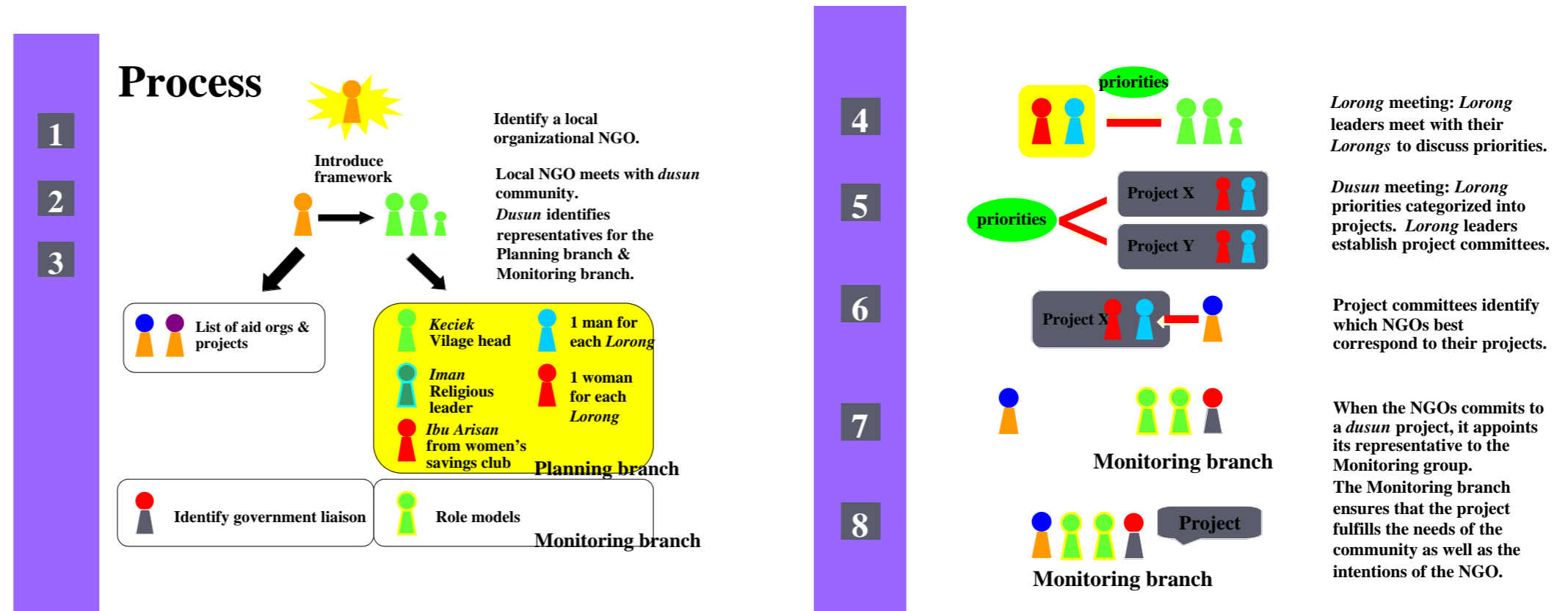
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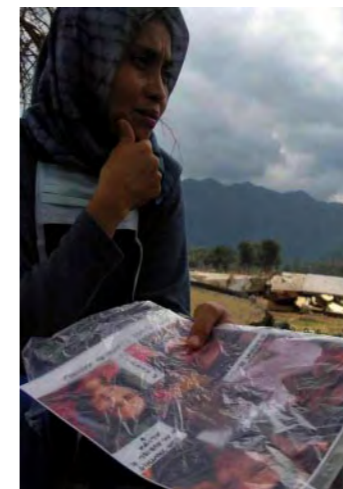
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Outcome

- Helps **restore** social structure
- **Empowers** communities
- **Builds trust** between actors
- **Manages** aid resources



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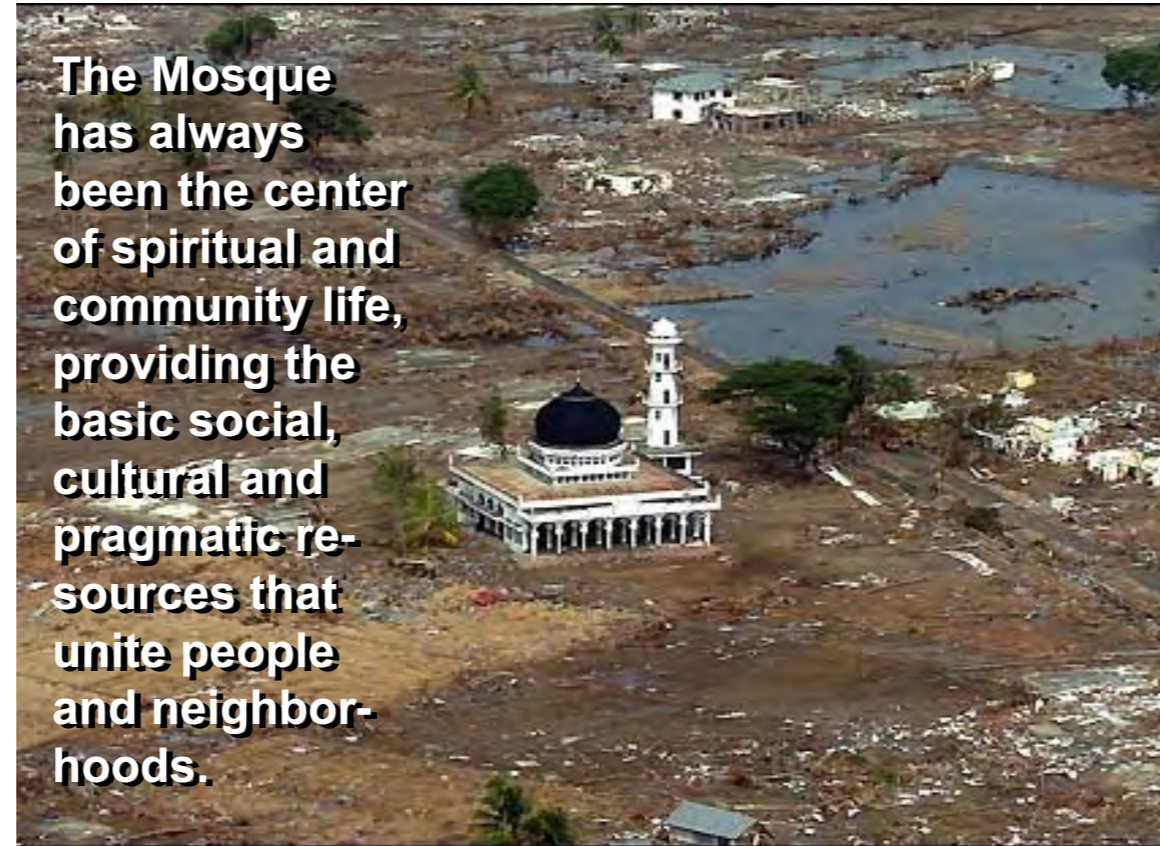
**Brainstorm innovations
in rebuilding communities
in the
Tsunami affected countries.**

"100 MOSQUES 100 DOSOONS"
(Team MIT-2) Drawing on strong cultural traditions, a central mosque becomes the key organizing element for new communities ('dosoons') and a reliable 'safe haven'. Within a planning framework of canals that shift villages to safer inland locations, construction is achieved quickly through innovative precast elements, promoting local participation and employment. Omar Rabie, Scott Francisco, Anahita Anandam; MIT.

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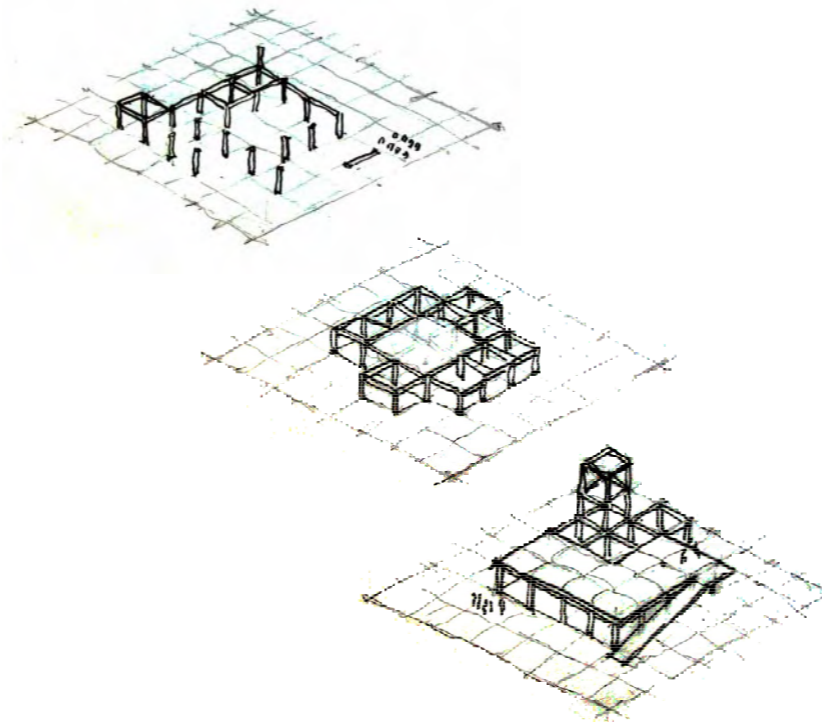
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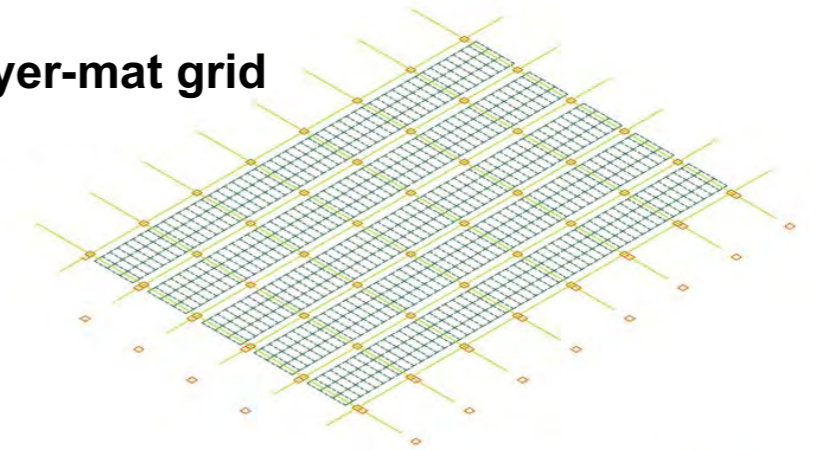


The Mosque has always been the center of spiritual and community life, providing the basic social, cultural and pragmatic resources that unite people and neighborhoods.

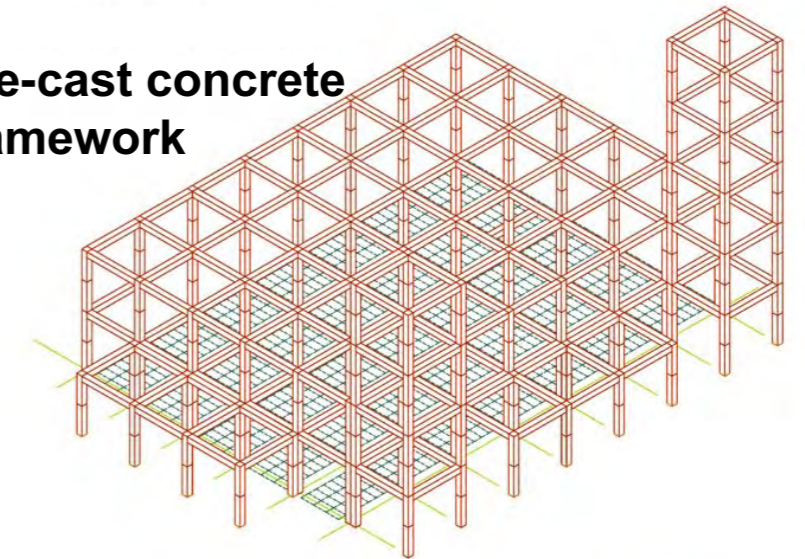
The construction of community mosques or madrassas is the critical first step in rebuilding infrastructures that allow communities to function properly once again.



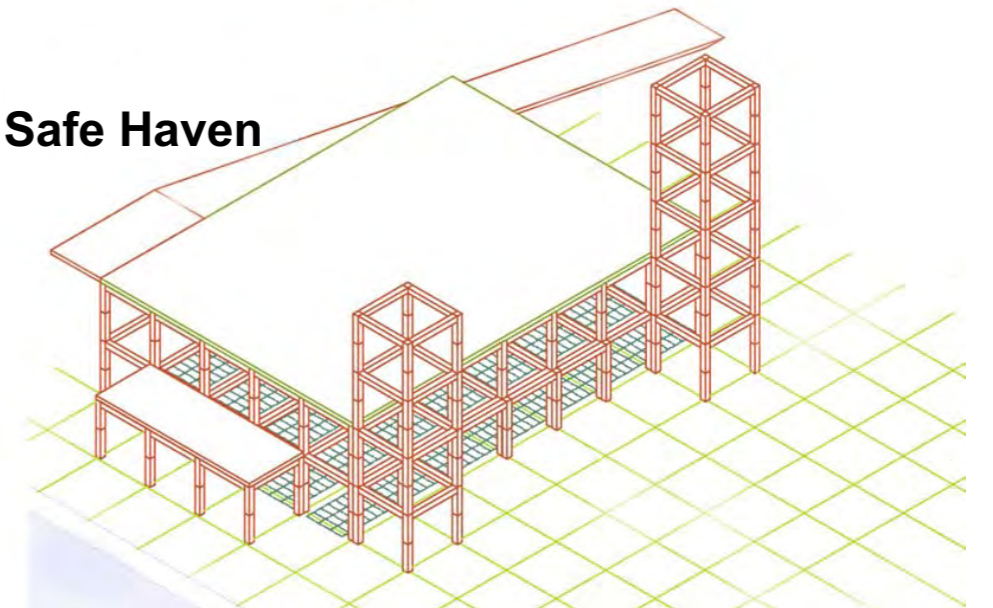
Prayer-mat grid



Pre-cast concrete framework



Safe Haven



WE ACCEPT THE CHALLENGE! - Team MIT 2

The Tsunami Challenge

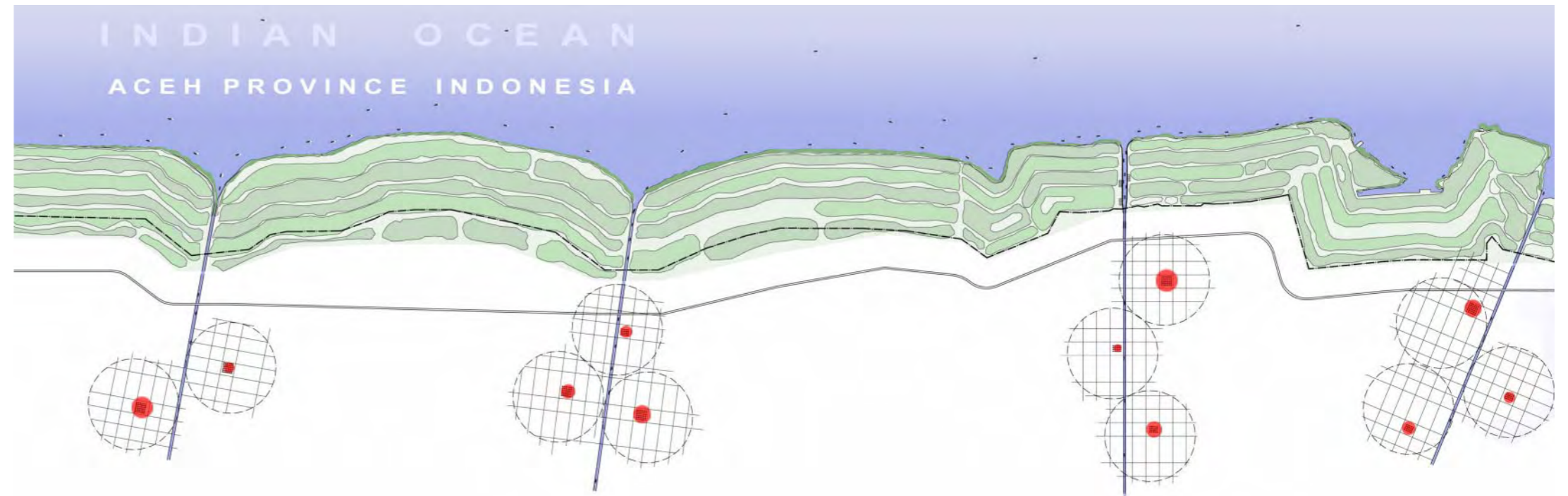
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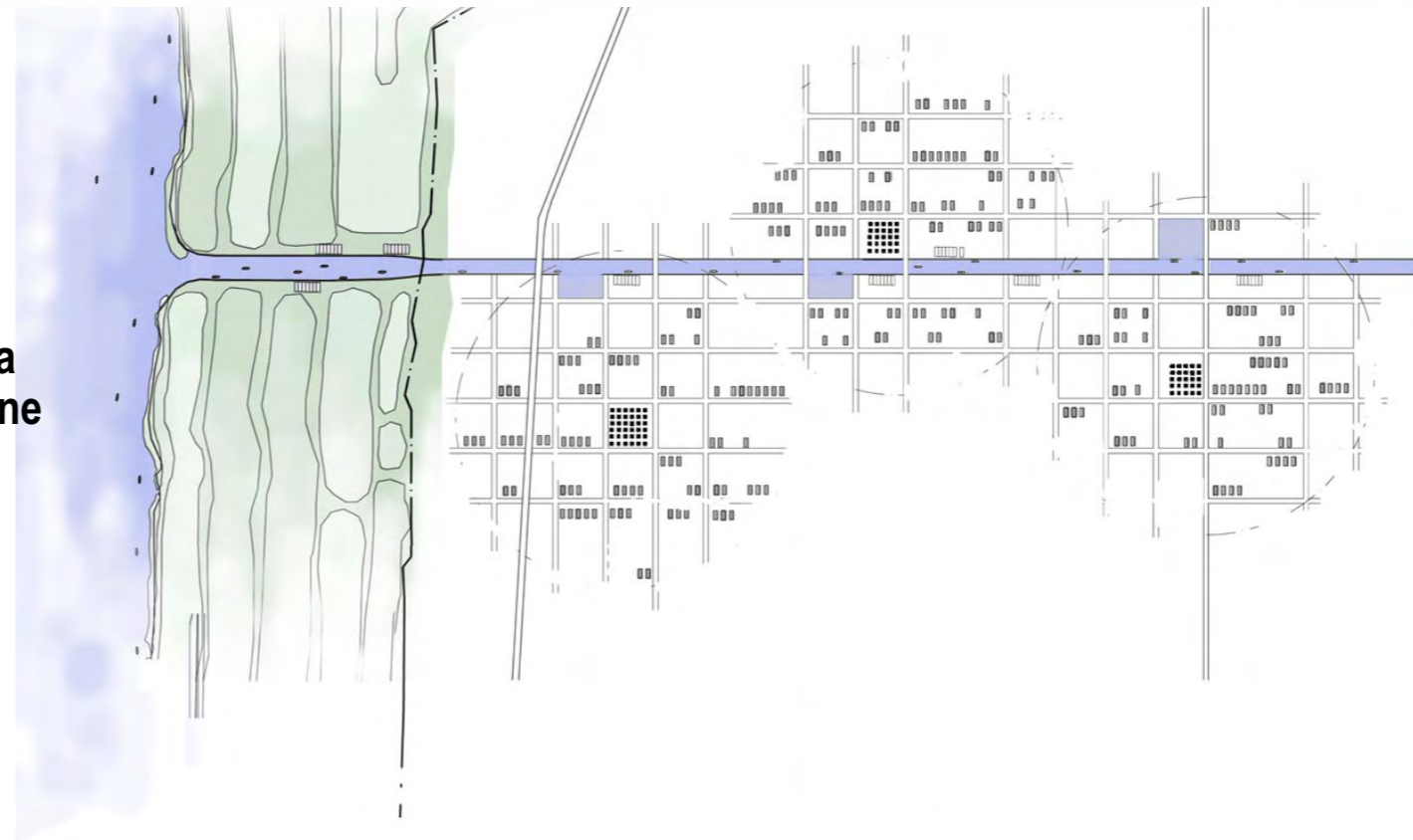
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A **new canal** for each
town maintains the
fishing community
connection to the sea
inspite of a buffer zone
setback.



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"FROM HOUSING TO HOME:
AN URBAN PLAN FOR
TUSUNAMI RELIEF"
(Team BAC-1)
A low-tech, low-rise community
built urban block is the organiz-
ing principle of a planning
framework designed to address
immediate needs for shelter
while creating viable permanent
neighborhoods.
Jessica Wattman, Erin White,
Alexandra Escobar; Boston
Architectural Center and MIT.

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An urban plan for tsunami relief:

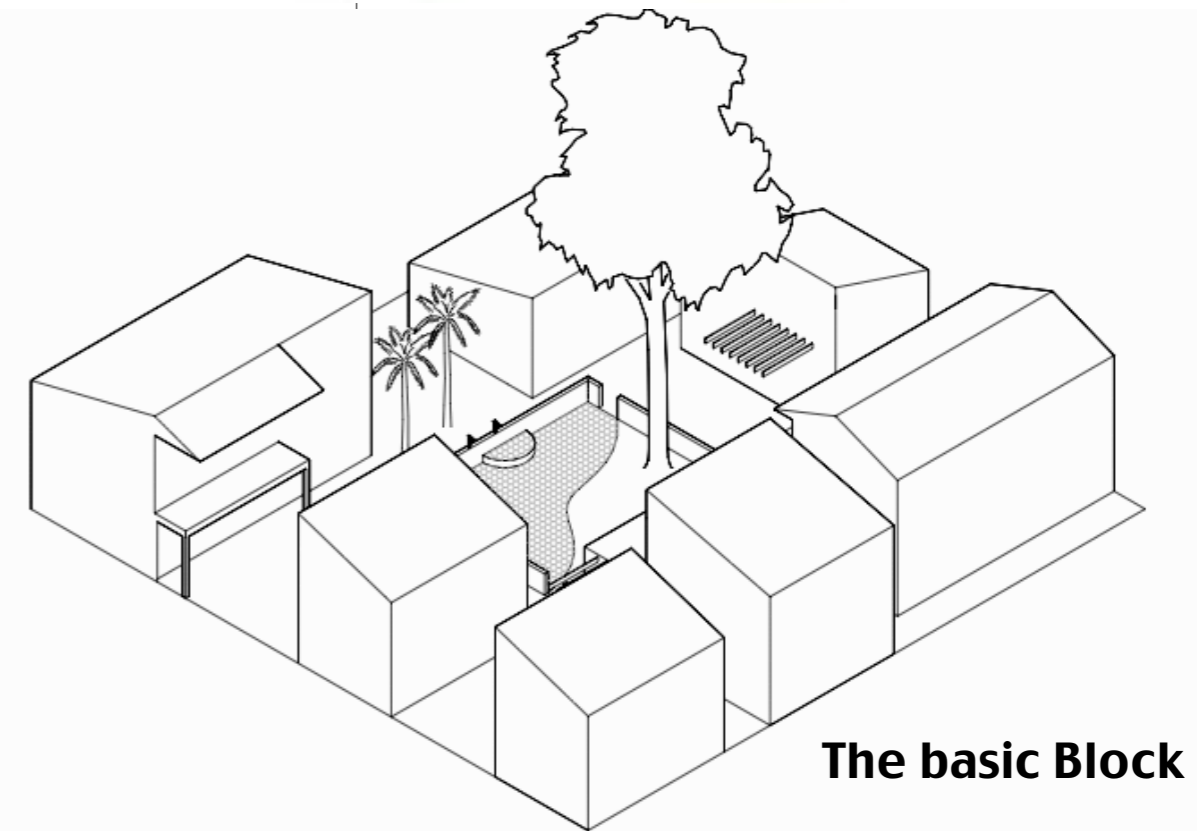
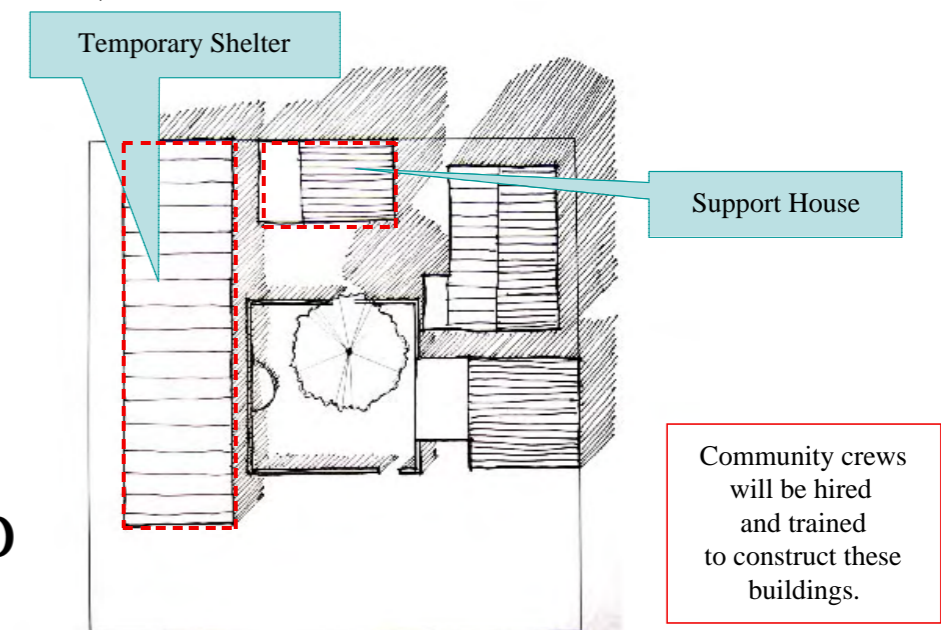
A repeating urban block

immediate shelter and roots for strong community

an architecture of security (shelters and walls)
of support (communal rebuilding)
of trust (fresh water, trees)



Monuments to
rebuild identify



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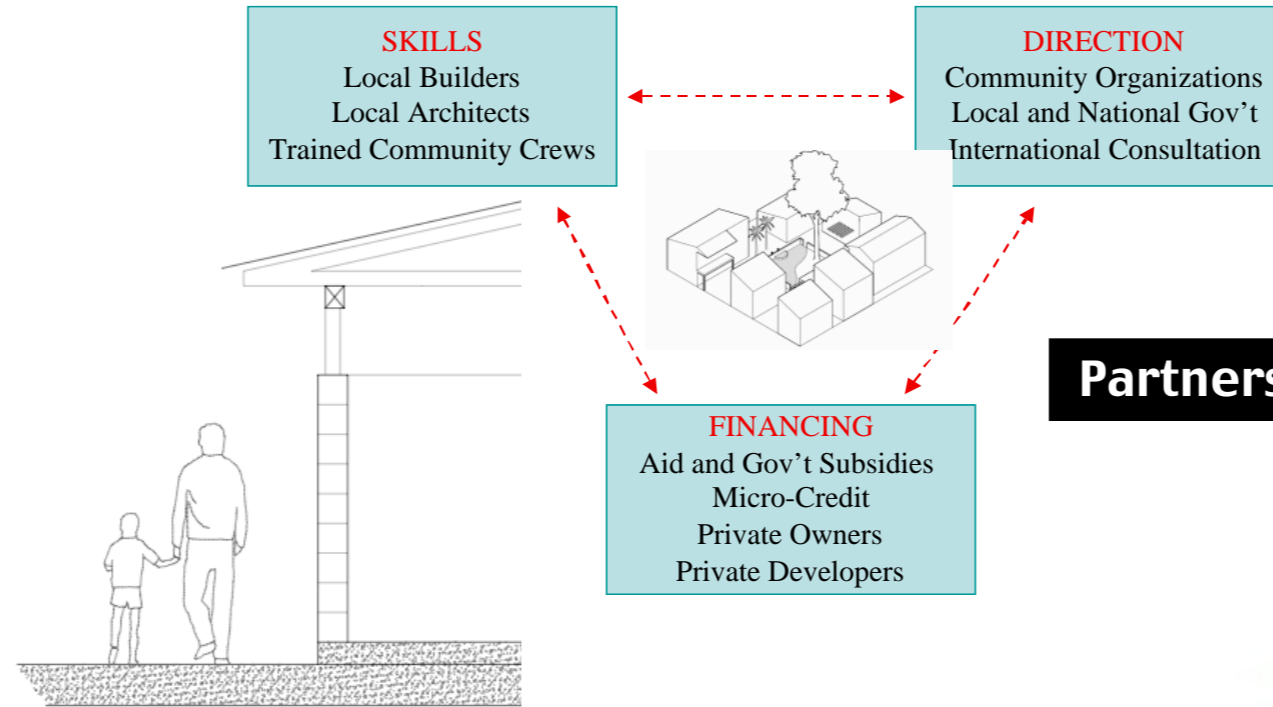
A low-tech, low-rise community built urban block is the organizing principle of a planning framework designed to address immediate needs for shelter while creating viable permanent neighborhoods.

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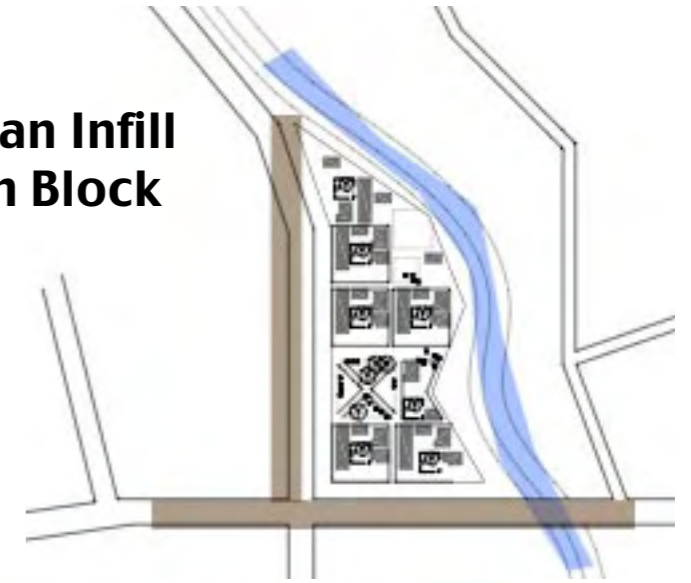
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Partnerships

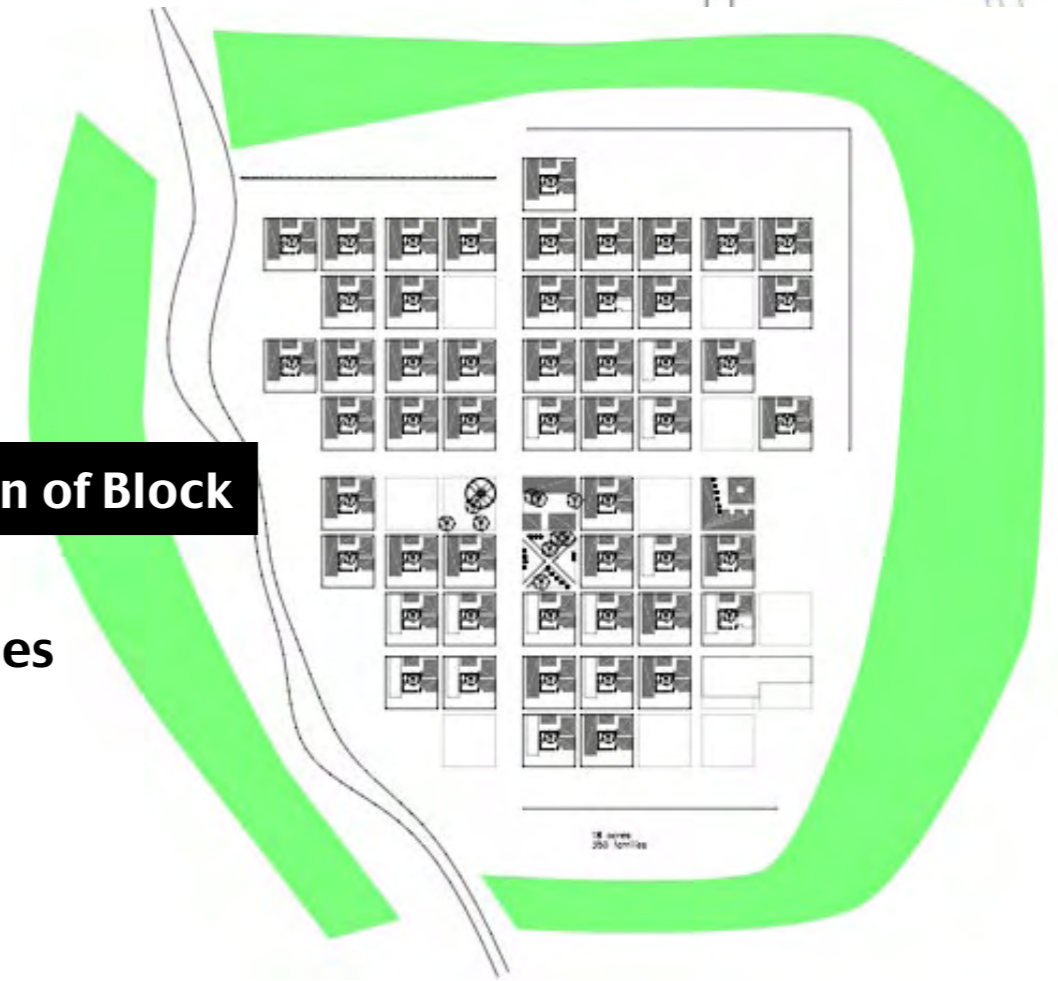
Urban Infill with Block



Local and innovative materials through self-help

Replication of Block

18 acres
350 families



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"DEVIATING FROM THE D.U.Z
(De-Urbanized Zone)" (Team
RISD-1)

Development of a social core for
reestablishing the water-based
economy, with housing to be
built with simple materials by
families.

Tighe Butler, Davit Elecson,
David Dwight, Jennifer Niem;
Rhode Island School of Design.

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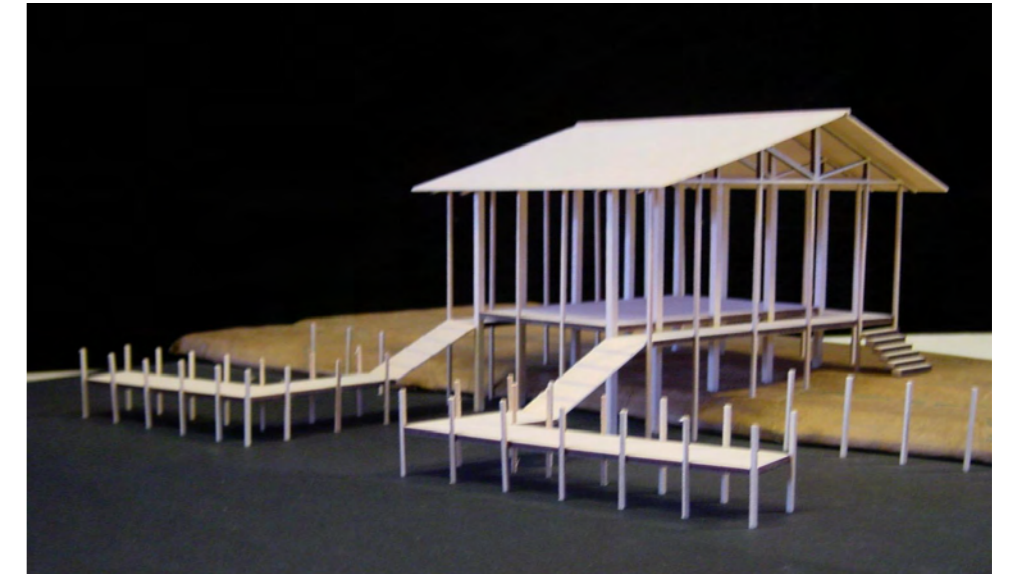
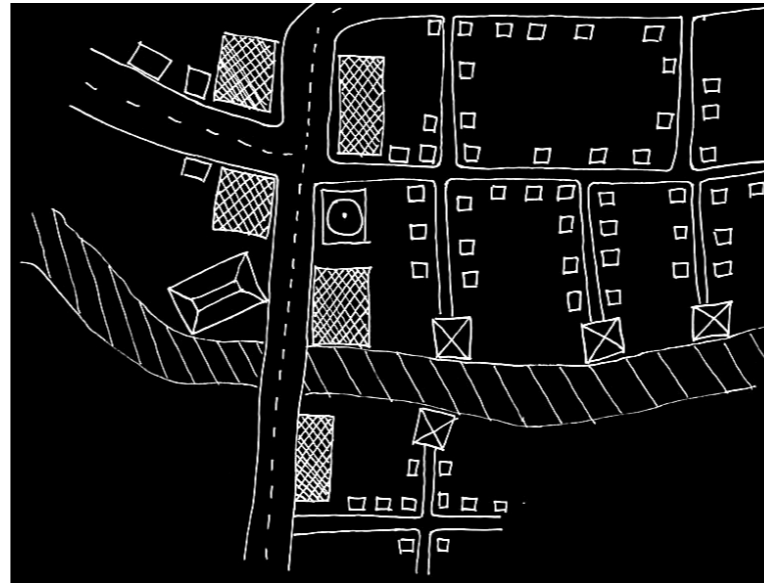
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Urban Growth Model

Approximate population:
1 Menasa – 300 people

4 – 5 Dusuuns
(neighborhoods)

Meeting house, market,
Mosque, commercial zones
structured in relation to water
body and main roads.



Meeting House as
Neighborhood **Anchor**

Modular Housing Unit Kit

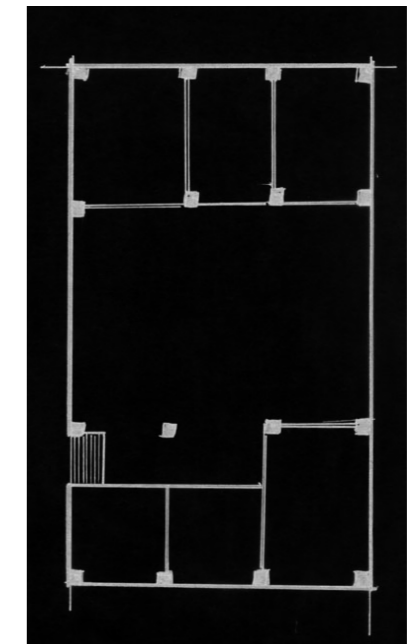
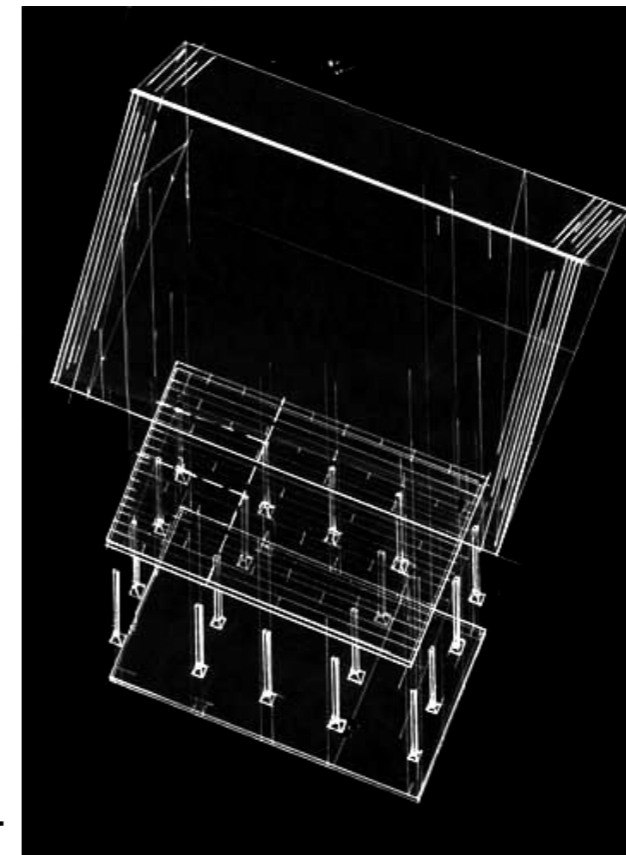
Kit Contents:

Slab and Footings
Footings
Planks
Claddings
Roof



Available in centralized dis-
tribution centers

Provides a simple frame-
work to be modified by resi-
dents



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DEVIATING FROM THE NEW D.U.Z.*

RISD1: TIGHE BUTLER, DAVID DWIGHT, DAVIT ELECSO, JENNIFER NIEM

EXISTING CONDITION - BANDA ACEH



THE D.U.Z. - THE IMPOSED 'NO-BUILD' ZONE

- REDUCES IMPACT OF TSUNAMIS ON URBAN DEVELOPMENT
- REMOVES POPULATION FROM THE BASIS OF THEIR SOCIO-ECONOMIC STRUCTURE - THE OCEAN
- WILL LIKELY RESULT IN QUESTIONABLE SQUATTER DEVELOPMENT



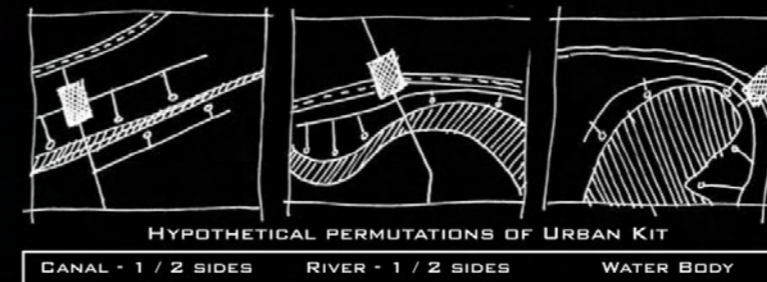
EFFECTIVE DUSUUN/HAMLET SOCIAL STRUCTURE

- SUPPORTS COMMUNAL SPACES AND COMMUNITY EFFORTS
- SKILL SETS COULD ALLOW FOR SELF SUFFICIENCY AND SELF-RELIANCE
- SOCIAL CONDITION CAN BE REINFORCED AND UTILIZED IN SHAPING A NEW URBAN CONDITION

PROPOSAL GOALS:

- SOLIDIFY DAMAGED WATER-BASED ECONOMY SO INDEPENDENT GROWTH MAY TAKE PLACE
- ESTABLISH SOCIAL AND ECONOMIC CORES FOR FUTURE URBAN GROWTH
- BUILD TO ENSURE SURVIVAL OF LIVELIHOOD AND SOCIAL STRUCTURE IN IMMEDIATE AFTERMATH OF FUTURE DISASTERS

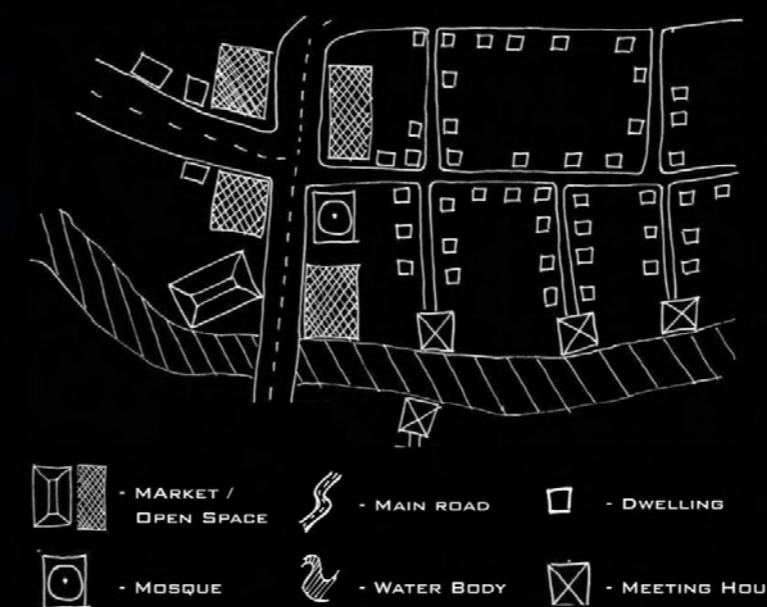
THE URBAN GROWTH KIT



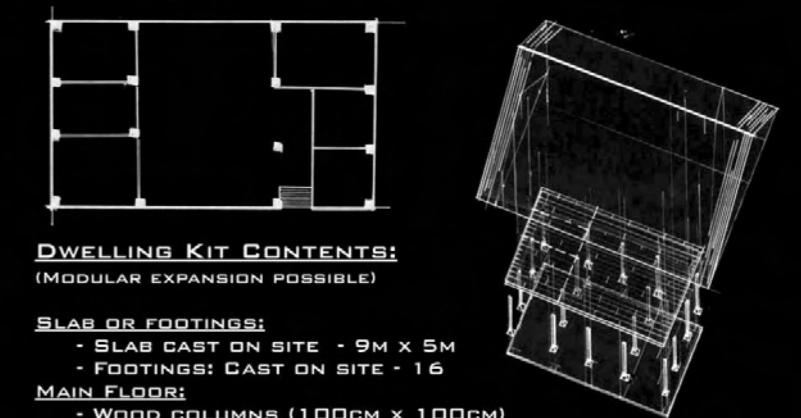
URBAN KIT CONTENTS:
 SERVES 1 MENASA (300 PEOPLE, 4 - 5 DUSUUN)

- INFRASTRUCTURE:**
- WATER BODY (CONSTRUCTED OR MODIFIED)
 - TWO LANE 'MAIN' ROAD
 - UTILITIES (ASSOCIATED WITH ROAD)
 - LOT DELINIATION (FOOTINGS OR FOUNDATIONS)
- PUBLIC/ECONOMIC SPACE:**
- OPEN SPACE
 - ZONED SPACE FOR MOSQUE
 - ECONOMIC AREAS (ZONED AND/OR BUILT)
 - ASSOCIATED WITH MAIN ROAD AND WATER BODY
- COMMUNITY SPACES (ONE/DUSUUN):**
- MEETING SPACE FOR 70+ PEOPLE
 - BOAT STORAGE
 - CONNECTED WITH WATER BODY
 - ANCHORS DUSUUN OPEN SPACE & NEIGHBORHOOD GROUPING
 - URBAN GROWTH POINT
 - ENSURES CONTINUED ACCESS TO WATER'S EDGE

EXAMPLE OF URBAN KIT

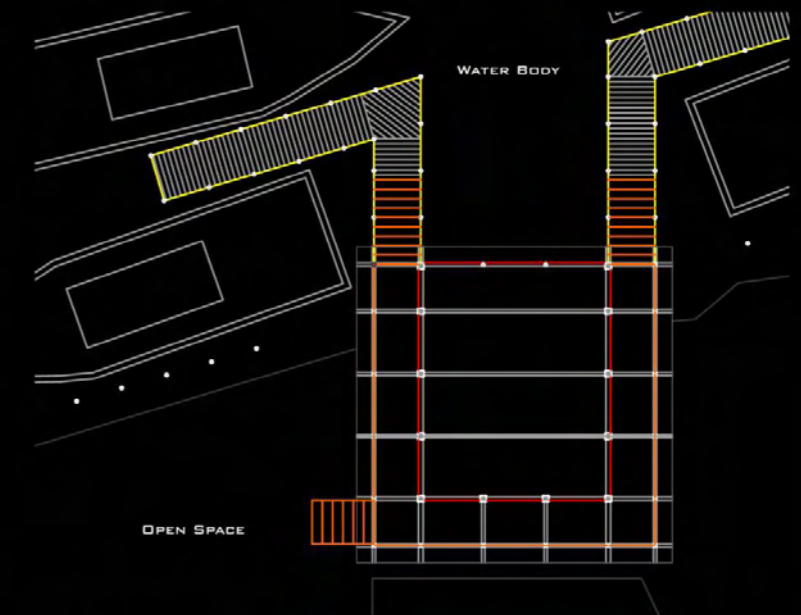


THE DWELLING KIT



DWELLING KIT CONTENTS:
 (MODULAR EXPANSION POSSIBLE)

- SLAB OR FOOTINGS:**
- SLAB CAST ON SITE - 9M X 5M
 - FOOTINGS: CAST ON SITE - 16
- MAIN FLOOR:**
- WOOD COLUMNS (100CM X 100CM)
 - PREFAB. STRUCTURAL MEMBERS - 4
 - WOOD PLANKING
 - CLADDING AT OCCUPANTS DISCRETION
 - PREFAB METAL STD. PARTITION WALLS
- ROOF:**
- PREFAB STRUCTURAL MEMBERS - 4
 - LOCAL THATCH OR CORRUGATED METAL



MEETING/BOAT HOUSE

- HELPS STRUCTURE WATER'S EDGE WITH CONNECTION TO COMMUNAL OPEN SPACES
- PROVIDES SPACE FOR RITUAL GATHERING AND OTHER COMMUNAL EVENTS
- HOUSES AND SUPPORTS DUSUUN BASED ECONOMIC RESOURCES
- CUSTOMIZED TO SPECIFIC LOCATION (AS PART OF URBAN KIT)

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A multi-component proposal which includes early warning system, an evacuation system, barriers to reduce impacts, and 'ecotels' to rejuvenate tourism, with innovative strip typologies in the urban layout to reduce damage and safe havens through multi-purpose facilities. Grant Sharpe, Ajit Singh, Anubhav Gupta, Kaustuv De Biswas, Rakhi Bhavnani; MIT and GSD.

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THE MASTER PLAN

Problem Massive Destruction with little to no chance of Stopping

Solution Mitigation through three Concepts

- Disaster Response Mechanisms
- Minimize Damage
- Community Development and Revitalization

Disaster Response Mechanisms

- Early Warning System
- Evacuations Routes
- Safe Havens

Minimizing Damage

- Zoning & Dev. Strategies
- Barriers
- Building Guidelines

Community Development and Revitalization

- Public Education and Awareness
- Tourism and Revitalization
- Eco-tels / Eco-tourism

Disaster Response Mechanisms

SAFE HAVEN
CASE STUDY STADIUM



- Large-scale multi-purpose disaster center
- Safe haven in emergency
- Shelter, medical center, distribution/communication center for NGOs
- Regularly used as disaster education centers, community development, training
- Existing buildings retrofitted

TARGET BUILDING TYPES

- Community Centers
- Large Halls
- Sports Arenas
- Schools

Disaster Response Mechanisms

“Run for the hills” evacuations

Early Warning Systems

- Underwater Buoys
- Use of In-place communication systems wherever possible ex. Aceh
- Implement “Tornado style” Warning Sirens in other at risk areas ex. Sri Lanka
- Public Awareness of the Warning Systems

Evacuation Routes

- Warning Useless if no way to run
- Most at-risk populations can still move 1 km. in 20 mins
- Create Gathering Places connected to fast evacuation networks to the Safe Havens.
- Solution: Horizontal and Vertical Evacuation
- Vertical: Climb designated stairs



Disaster Response Mechanisms

SAFE HAVEN Building Guidelines Necessary Components

- Sized for capacity expected
- Sleeping Quarters
- Sanitation
- Food and Water

Helpful Components

- Medical Facilities
- Helicopter/ Transport
- Communication Center
- Food/ Aid Distribution



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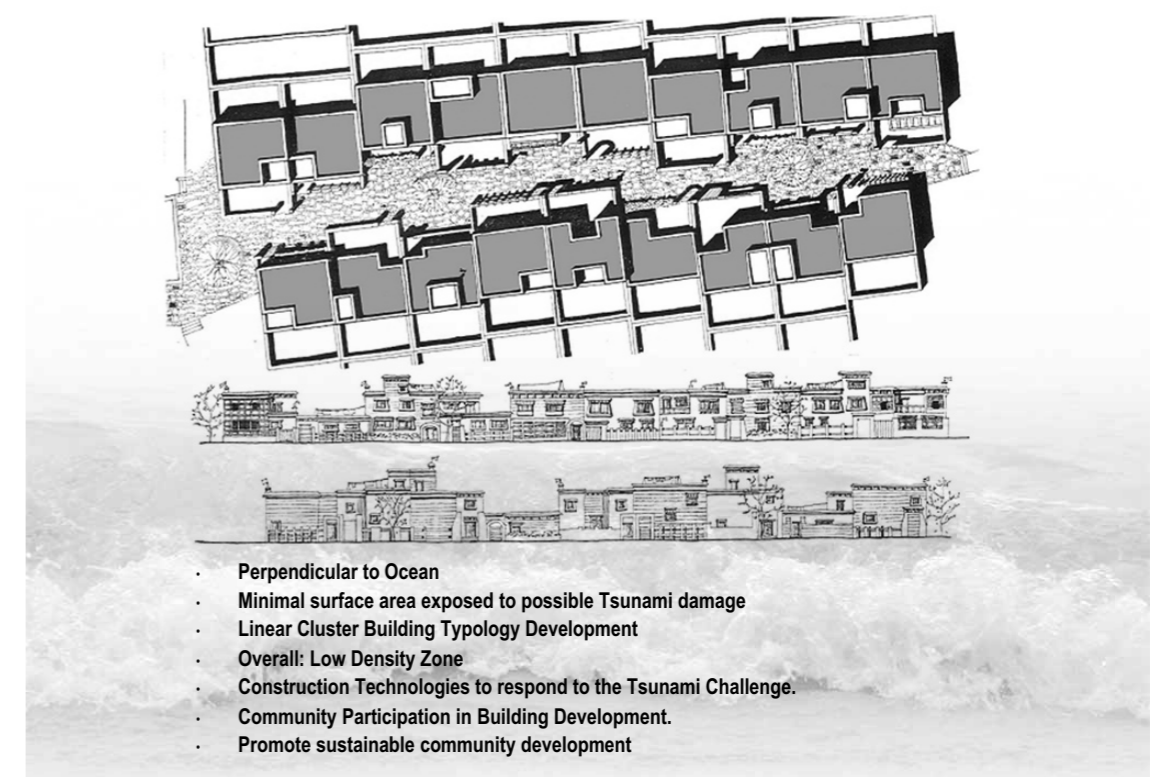
Minimizing Damage

- Zone 1 0-100m**
- Only open and non-permanent structures
 - Kiosks/ Cabana or Religious style structures
- Zone 2 100-600m**
- Increasing Height
 - Mangrove swamps
 - Other "natural" barriers - hills, berms, ditches
- Zone 3 600m-1.5km**
- Low Density Building interspersed with forests and barriers
 - Cluster Style
 - Raised Buildings
- Zone 4 1.5km on**
- Beyond Expected Inundation Zone
 - Higher Density
 - Safe Havens



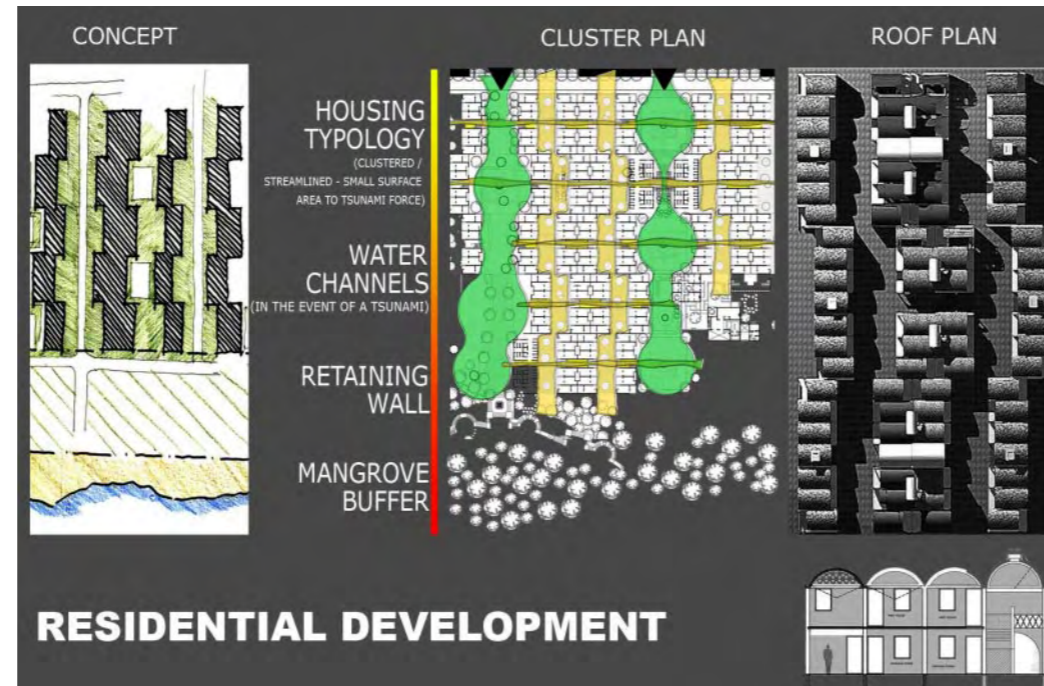
Minimizing Damage

Building Guidelines

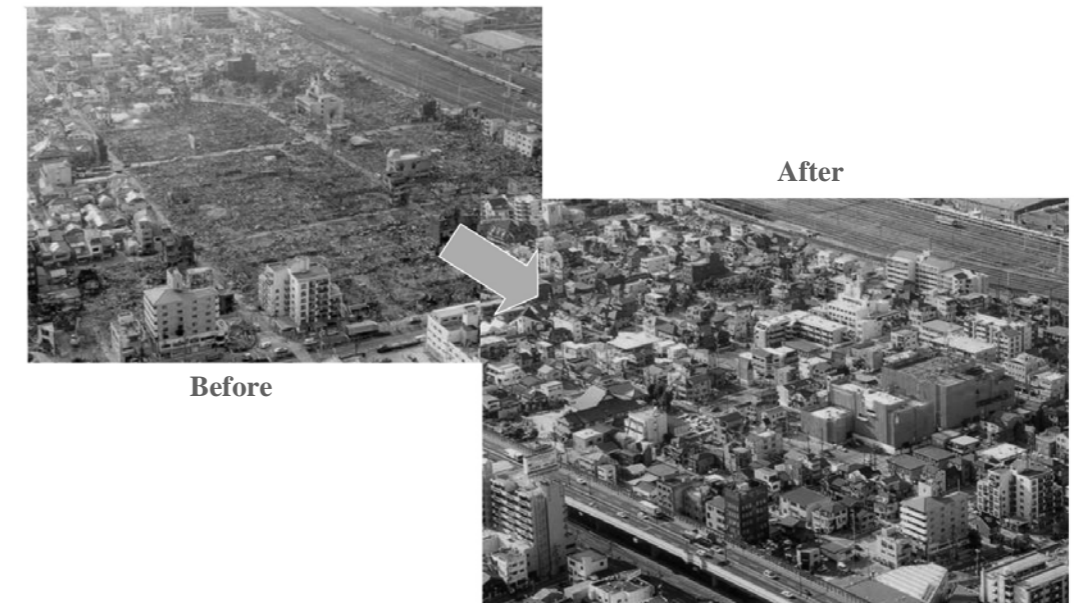


Minimizing Damage

Building Guidelines



Reconstructing Neighborhoods



WE ACCEPT THE CHALLENGE! - Team MIT 3

The Tsunami Challenge

Brainstorm innovations
in rebuilding communities
in the
Tsunami affected countries.

"POST-TSUNAMI RECONSTRUCTION GUIDELINES" (Team MIT-3)
A multi-component proposal which includes early warning system, an evacuation system, barriers to reduce impacts, and 'ecotels' to rejuvenate tourism, with innovative strip typologies in the urban layout to reduce damage and safe havens through multi-purpose facilities. Grant Sharpe, Ajit Singh, Anubhav Gupta, Kaustuv De Biswas, Rakhi Bhavnani; MIT and GSD.

A workshop for MIT and the Cambridge community during Springbreak – March 2005

Hosted by SIGUS, School of Architecture and Planning, MIT - Dr. Reinhard Goethert in collaboration with Prof. Robert Cowherd Rhode Island School of Design

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Community Development and Revitalization



Public Education and Awareness



Tourism and Revitalization through 'Ecotels' and Eco-tourism



Festivals as a device to revitalize communities using 'Safe Haven' structures for festivals



Create jobs - highlight and preserve local trade and culture

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