

**DISASTER-RESILIENT HOUSING AND ECONOMIC DEVELOPMENT**

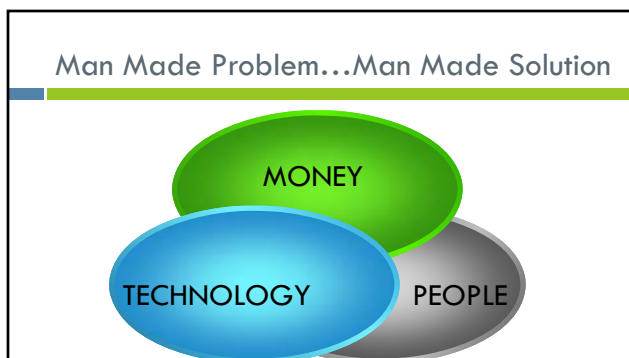
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EXECUTIVE ADVISORY BOARD MEETING  
APRIL 25, 2014

**BUILD CHANGE**

**IT'S NOT THE EARTHQUAKE THAT KILLS PEOPLE...**

**IT'S THE COLLAPSE OF A POORLY BUILT BUILDING.**



- Building Safe Houses in Developing Countries**  
*Like any development challenge, it comes down to money, technology and people*
- **TECHNOLOGY**
    - ▣ Earthquake-resistant construction will become common if the right technology is widely known, locally available, and culturally accepted.
  - **MONEY**
    - ▣ If the technology is too expensive, people will not use it. Homeowners need sufficient funds to build a safe house.
  - **PEOPLE**
    - ▣ Someone has to want the house to be earthquake-resistant: homeowner, government official, relief agency, or donor.

**About Build Change**

- Founded 2004
- Bricklayer, engineer, Ashoka-Lemelson Fellow
- Indonesia, China, Haiti, Colombia, Philippines
- Mission: Save Lives in Earthquakes
- >200,000 People in safer buildings

## What Build Change Does

- **INFLUENCE** post-disaster housing reconstruction policy
- **DESIGN** earthquake resistant houses and schools using locally available, culturally appropriate, widely known materials and technologies
- **TRAIN** builders, homeowners, government officials and engineers to build them
- Work with **PUBLIC** sector to create and implement building standards
- Work with **PRIVATE** sector to produce and sell better building materials, to build safe houses, and create jobs
- Facilitate access to financial and insurance-based **INCENTIVES** for safe construction
- **GOAL:** safe construction becomes the norm, before and after EQs and windstorms

## Post-Disaster Housing Reconstruction



Contractor-Driven or Donor-Driven



Homeowner-Driven Cash + TA



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## Lessons from Retrofitting in Haiti



1. Basics of Safe Building



2. Homeowner Meeting

## Lessons from Retrofitting in Haiti



3. House Inspection



4. Simple Calculations

## Retrofitting in Haiti



5. Simple Plan + BOQ



6. Homeowner Meeting

## Retrofitting in Haiti



BEFORE



AFTER

>1,600 Homes Completed; 23,000 By Others



DO: Empower People with Incentives + TA



DON'T: Create Dependency by Giving Houses Away


## Build Change Six Step Model

1. Learn First → Technical and Market Research
2. Design Earthquake-Resistant Houses for Local Context
3. Build Local Capacity → Builders, Engineers, Construction Professionals
4. Stimulate Local Demand → Homeowners and Government Officials
5. Facilitate Access to Capital
6. Measure the Change



### Build Change Three C's for Safe Construction

- Configuration
  - Simple, Square, Symmetric
  - Light, flexible = good
  - Heavy, brittle = bad
- Connections
  - Everything tied together: walls to foundation, walls to beams and columns, beams and columns to each other, roof to walls
- Construction Quality
  - Clean sand, angular gravel, fully fired bricks, well made blocks, new steel of sufficient diameter, timber protected from insects and water, good masonry workmanship



### Earthquake-Resistant Confined Masonry House for Aceh, Indonesia



Lightweight roof cover on timber truss connected to the walls

Traditional Acehese timber in the gable

Reinforced concrete tie columns and bond beams "confine" the masonry wall together

Steel reinforcement in between the bricks, connects the walls to the columns


Masonry wall built with locally available, good quality materials and workmanship

WINNER 2006 Excellence in Structural Engineering Award  
Structural Engineers Association of Northern California

Simple, square, symmetric layout

Good quality steel tied together


### If Bricks Are Laid Dry...



**Bad Practice**  
Wall will be weak  
Easy to crack or overturn wall by striking with a fist

www.buildchange.org

### Soaking Bricks in Clean Water Prior to Laying



is one of the most important steps to improve the strength of masonry walls built in Indonesia, and their performance during earthquakes

### Training – 20,000 People

- Builders
- Engineers
- Homeowners
- Vocational Students
- Government Officials
- Relief Agency Personnel
- Building Materials Producers



### Video - Women Builders

- J/P HRO and World Bank Adolescent Girls Initiative (AGI)





Private Sector Partnerships




Nicolas Chevelon





Public Sector Partnerships

- China
- Indonesia




Public Sector Partnerships

- Haiti






### Social Marketing Materials

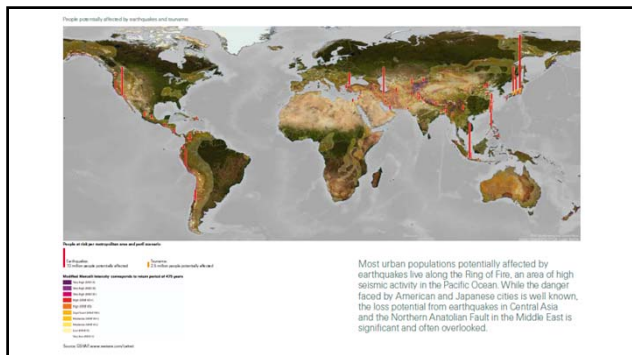
The collage features various educational materials: a poster with the title 'ANN REHABI BYEN EPI SAN BANJA', a brochure titled 'GUÍA FOTOGRAFICA DE REFORZAMIENTO', and several smaller posters with diagrams and text in multiple languages.

### Primers for USAID

<p><b>BUILDING BACK HOUSING IN POST-DISASTER SITUATIONS – BASIC ENGINEERING PRINCIPLES FOR DEVELOPMENT PROFESSIONALS: A PRIMER</b> DRAFT</p>	<p><b>Seismic Retrofit of Housing in Post-Disaster Situations – Basic Engineering Principles for Development Professionals: A PRIMER</b> DRAFT</p>	<p><b>Site Hazard Mitigation in Post-Disaster Situations – Basic Engineering Principles for Development Professionals: A PRIMER</b> DRAFT</p>
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### Financing and Insurance Partnerships

- Sogesol – IFC – Build Change
- Incentives for Safety
- Seeking more partnerships



# 2024: 10 MILLION PEOPLE IN SAFER BUILDINGS

## Partnerships Key to Scale

- Donors, foundations and relief agencies
- Governments
- Financing institutions
- Cement companies
- Insurance companies

## Major Partners - Foundations



## Major Partners - NGOs



## Major Partners – Corporate & Gov.



## Build Change and CU

1. Five CVEN 5929 Practicum Placements
2. Graduate Student Research
3. Looking for More Opportunities

THANK YOU

[buildchange.org](http://buildchange.org)

[@buildchangenews](https://twitter.com/buildchangenews)