

**Technology-Facilitated Crowdsourcing Systems****Zhi Zhai****Publication Date**

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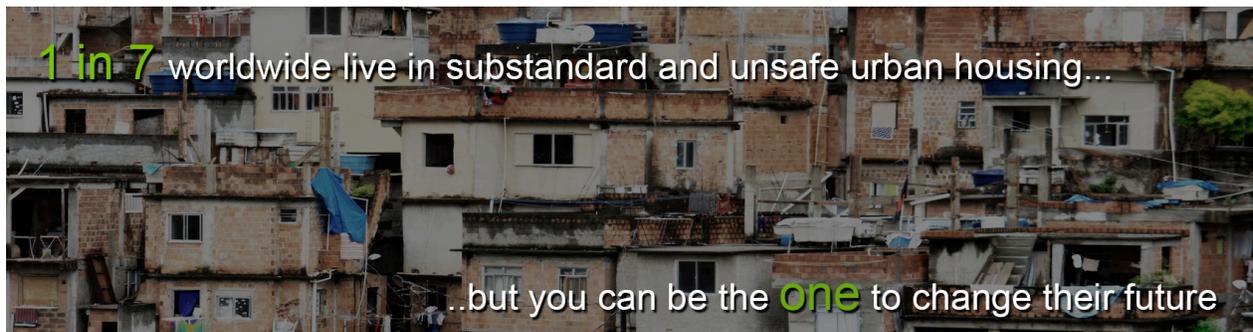
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**TECHNOLOGY-FACILITATED CROWDSOURCING SYSTEMS**

**SUPPLEMENT DATA SET II**

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**SHELTERS FOR ALL: A CALL TO DELIVER SAFE, AFFORDABLE  
HOUSING TO THE WORLD'S POOR**

COMPETITION GUIDELINES

ALL SUBMISSIONS MUST BE RECEIVED AT **SHELTERSFORALL.ORG** BY:  
JANUARY 15, 2012

WINNERS ANNOUNCED: FEBRUARY 15, 2012

See [SheltersforAll.org](http://SheltersforAll.org) for Frequently Asked Questions or email  
**info@SheltersForAll.org**

## INTRODUCTION

Fifteen of the twenty most populated cities in the world (“megacities”) are currently located in developing countries, reflective of a wider trend that places the majority of the world’s population in urban zones for the first time in human history. Often cities cannot support the influx of persons seeking greater educational and economic opportunities, resulting in densely populated, unstructured settlements or slums that have become prevalent throughout the developing world. The lack of adequate shelter, safe drinking water, proper sanitation and other basic necessities dominates this landscape. Economic opportunities are infrequent at best, and without economic growth and stability these settlements become entrapped in substandard living conditions.

Those with limited financial resources are more likely to live in housing that suffers from numerous vulnerabilities. Attempts to improve these housing conditions are complicated by the reality that many poor areas have limited natural resources which makes it very difficult to produce quality construction materials. Moreover, the weak enforcement or complete absence of building codes, regulations, inspections and general oversight creates a situation in which community planning and forethought about housing construction as a whole are non-existent. When one considers that many of these urban unstructured settlements lie in parts of the world that are subject to a multitude of environmental threats, e.g., hurricanes/typhoons/cyclones, earthquakes, and heavy rains/flooding, “megadisasters” in expanding “megacities” are inevitable.

## COMPETITION OVERVIEW

Recognizing the need for housing innovations, this competition is designed to tap the creativity of individuals and teams to deliver low-cost and safe housing to the world’s urban poor. This is a challenging problem, which is why we are soliciting, from the global community, creative solutions that tackle this problem in new and innovative ways. We are looking for solutions that are mindful of the historical context and cultural preferences of the communities in which the housing will be built. While adoption and sustainability by a target country or region is important, we also hope that innovative solutions can be used in other places. As such, successful designs are ones that balance:

- **Resiliency:** can insure life-safety and protection against natural disasters and other environmental factors
- **Feasibility:** can be practically implemented using locally available technologies, capabilities and materials
- **Sustainability:** can be supported indefinitely using local resources (economic and natural), technologies and skill sets of the community and can adapt with their evolving needs
- **Viability:** can earn the support of most local stakeholders as culturally appropriate, so that ideas are not just accepted, but embraced and promoted
- **Scalability:** can be applied in other communities beyond the particular country or region used for solution development

Creating new paradigms for low-income urban housing in developing countries is a multi-stage process requiring research into zoning regulations, utility systems, financing systems, and community dynamics, followed by detailed engineering analyses and calculations. However, the objective of this competition is not to execute such a comprehensive process. Rather the objective is to “jump-start” this process with new concepts and ideas for housing, supported by preliminary analyses that demonstrate the proof of concept and reflect the submitter’s considerations of the many non-technical factors that dictate whether designs will ultimately be successful.

## **COMPETITION DESCRIPTION AND SUBMISSION REQUIREMENTS**

This competition is searching for urban housing designs that meet the needs of the developing world in a feasible, sustainable, and viable way. Below you will find an outline of the basic requirements of a submission to this competition. In particular the questions listed below demonstrate the attributes that will be considered by the panel judging the designs and should therefore be considered when developing your design. These encompass wide-ranging issues such as the potential of the solution to be locally sustained, the barriers to access (related to construction complexity, cost), the resilience of the design to various hazards, the potential for cultural acceptance, security and durability. Note that while you are encouraged to have a specific country or region in mind when developing your solution, the ability of solutions to scale to other parts of the developing world will also be evaluated.

### **ELIGIBILITY:**

- Competition is open to anyone who wants to take the time to think critically and creatively about the global housing problem in developing countries. Background in engineering or architecture is not necessary.
- Submissions can be generated by registered individuals or teams of individuals who are legal adults (18 years or older) that have agreed to the posted Competition Rules, Terms and Conditions and completed all required submission activities at the website: [sheltersforall.org](http://sheltersforall.org)
- Individuals can only submit one proposal to the competition (either as an individual or as a member of a team)
- Individuals cannot be employed/supervised by any of the faculty associated with this project (Professors Kijewski-Correa, Hachen, Madey, Kareem, and Thain of the University of Notre Dame)

### **HOUSING MODEL REQUIREMENTS:**

- Single story, single family residence
- Suitable for use in urban zones that serve the poorest citizens of the particular developing country/region the submitter chooses to focus on
- Incorporates design features appropriate for environmental conditions/climate of the particular developing country/region the submitter chooses to focus on
- Consistent with the level of economic resources and construction technology of low-income populations of the particular developing country/region the submitter chooses to focus on
- Floor plan should range from 60-100 sq. meters (~700-1100 sq. feet)

- Must accommodate at least a family of four
- Does not need to include:
  - Bathroom or kitchen (these can be external to the home)
  - Utilities (water, sewer, electrical)
- Optional features:
  - Mosquito Protection System
  - Ventilation System
  - Outdoor Space/Porch

## INFORMATION REQUIRED FOR SUBMISSION

In order to facilitate and standardize submissions, we are asking that all proposals be submitted through an online web form that contains a series of three types of questions that must be answered and which are detailed more fully in the table below:

- (1) **General Information:** mixture of required short answer and multiple choice questions that summarize the overall concept, the context, projected cost, and estimated construction time.
- (2) **Basic Features:** multiple choice and an optional short answer field to provide an explanation of the response. Explanations are limited to 500 characters.
- (3) **Custom Features:** multiple choice questions with required explanation. Each explanation is limited to 1000 characters.

All submissions must also include a PDF file that is uploaded and which contains diagrams, schematics, renderings and other supplementary materials (explained below).

Note that all responses must be in English and are subject to stated character limits. It is not expected that submitters will be able to fully or accurately answer all these questions for such a preliminary design. However, submitters should attempt to answer each question to the best of their ability based on their opinions/experiences.

General Information	
What is the target of your proposal?	Multiple Choice, Available Choices: (1) A specific country, (2) Multiple countries within a region, (3) No specific country or region (generally applicable)
[If (1) was selected above] What country are you targeting?	Multiple Choice, Available Choices: <List of countries>
[If (2) was selected above] What region are you targeting?	Multiple Choice, Available Choices: Latin America/Caribbean, Africa, Middle East, Asia-Pacific, Other
[If (3) was selected above] If you had to specify a region that your proposal is most suited for, what region would that be?	Multiple Choice, Available Choices: Latin America/Caribbean, Africa, Middle East, Asia-Pacific, Other
What is the biggest issue preventing access to adequate urban housing? If you targeted a specific country or region, then focus your response on that	Short answer, Limit 2000 characters

country/region.	
What single aspect of your housing model best addresses this issue?	Short answer, Limit 2000 characters
What is the biggest strength (innovation) of your design?	Short answer, Limit 1000 characters
What is the biggest weakness (vulnerability/limitation) of your design?	Short answer, Limit 1000 characters
Do you think your home will be accepted by the population it is intended to serve?	Multiple Choice, Available Choices: Yes: since it is similar to housing currently in use, Yes: since it is similar to housing not presently in use but used in the past, Yes: but will require education/marketing, No: they likely would live in it only if they had no other options).
Explain how cultural considerations within the population of the country/region targeted are accounted for in the design.	Short answer, Limit 1000 characters
Can your design be translated to other parts of the developing world?	Multiple Choice, Available Choices: Yes without need for modifications, Yes but will require modifications, No specific to a single country.
Explain your response and the nature of any modifications required to scale your design for use elsewhere.	Short answer, Limit 2000 characters
<b>Basic Features</b>	
How many rooms does your home have?	Multiple Choice, Available Choices: 1-2, 3-4, More than 4
How is your home constructed?	Multiple Choice, Available Choices: Completely prefabricated, Partially prefabricated/modular, Completely constructed on-site
What construction material are you proposing to use? (Select all that apply)	Multiple Choice, Available Choices: Timber/Bamboo, Concrete, Block/Masonry/Brick, Steel, Earth/Adobe, Waste/Recyclables, Synthetics, Other Organics, Other
Of the materials specified above, which is your <u>primary</u> construction material?	Multiple Choice, Available Choices: Timber/Bamboo, Concrete, Block/Masonry/Brick, Steel, Earth/Adobe, Waste/Recyclables, Synthetics, Other Organics, Other
What manufacturing process is used for the <u>primary</u> construction material in your designed home?	Multiple Choice, Available Choices: Raw material, Handmade, Manufactured using human-powered machine, Manufactured using motorized-machine, Other
What is the availability of your <u>primary</u> construction material in your targeted country/region?	Multiple Choice, Available Choices: Presently available, Could be produced domestically, Will always need to be imported
How much expertise does your construction process require?	Multiple Choice, Available Choices: Can be done by non-experts, Can be done by non-experts with expert supervision on site, Can be done by a team non-experts and experts, Must be done by experts.

Taking into account the environmental conditions the home may be exposed to, how long do you think your house will last?	Multiple Choice, Available Choices: A year or less, More than 1 year but less than 5 years, More than 5 years but less than 10 years, More than 10 years
How secure is your home?	Multiple Choice, Available Choices: Its walls could be penetrated with bare hands, A person would need at least hand tools to penetrate the walls, A person would need at least power tools to penetrate the walls, A person would need something more than power tools to penetrate the walls
<b>Custom Features</b>	
Would your home's construction require specialized tools, machinery or equipment?	Multiple Choice, Available Choices: Yes or No
If yes, explain the nature of these specialized tools, machinery or equipment needed to construct your home. If no, discuss the type of traditional tools, machinery or equipment that is needed.	Short answer, Limit 1000 characters
How many man hours do you anticipate it will take to construct your proposed home?	Short Response [Note: A man hour is one hour's labor by one worker. For example, if you believe a crew of 4 workers working 8 hour days can build the home you designed in 5 days, then the construction time is $4 \times 8 \times 5 = 160$ man hours. A justification of this response will also be requested as part of the PDF submission.]
How much do you anticipate your home will cost in US Dollars?	Short Response [Note: This cost estimate should include materials and labor. A justification of this response will also be requested as part of the PDF submission.]
Rate your home's resistance to strong winds/hurricanes/typhoons/tropical storms.	Multiple Choice, Available Choices: Excellent, Very Good, Fair, Poor, N/A Short answer, Explain in 1000 characters or less
Rate your home's resistance to earthquakes.	Multiple Choice, Available Choices: Excellent, Very Good, Fair, Poor, N/A Short answer, Explain in 1000 characters or less
Rate your home's resistance to heavy rains/flooding.	Multiple Choice, Available Choices: Excellent, Very Good, Fair, Poor, N/A Short answer, Explain in 1000 characters or less
Rate your home's resistance to other environmental factors (e.g., mold/mildew, ventilation, fire resistance, insect resistance).	Multiple Choice, Available Choices: Excellent, Very Good, Fair, Poor, N/A Short answer, Explain in 1000 characters or less

In addition to answering the questions above in a web form, submitters are required to upload a single PDF, in English, that includes all of the following items:

- One page written summary of your design concept (12 pt, Times Roman Font, 1 inch margins, single-spaced)
- One page justification for the estimated construction time reported in the web survey

- One page justification for the estimated cost reported in the web survey
- Up to 5 additional pages of schematics, blueprints, renderings or images of the design. Dimensions should be provided. English or metric units are acceptable.