Housing for Urban Migrants

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H.U.M
SELCO Foundation is an open source, not for profit organization that engages in field-based R&D and ecosystem building for deployment of clean energy solutions that alleviate poverty in tribal, rural and urban poor areas. The organization works closely with practitioners in the social sector, energy entrepreneurs and partners from various developmental sectors.
The solution framework adopted by SELCO Foundation is: to create a network of innovative research and development Labs, across geographies which will design and implement scalable social innovations. The Foundation plays a pivotal role in catalyzing holistic solutions and replicable processes that are an outcome of customized sustainable energy solutions through a bottom to top multidisciplinary approach.
The HUM project comes under the Built Environment Vertical in the Urban Community Labs of Selco Foundation, based out of Bangalore, India.
OVERVIEW

17.8 million
Karnataka’s Urban population;

22.56% State population in slums.

21.5% of state slum population in Bangalore.

8.43 million population in Bengaluru;
47% growth over past decade.

1.4 million slum dwellers in Bengaluru;
597 declared slums

Housing For Urban Migrants

OVERVIEW
A look at the population and income pyramid reveals that the ‘bottom of the pyramid’ is in itself a heterogeneous mix of communities of varying vulnerabilities. The outreach of the planner’s eye has reached only a part of the urban poor – leaving many outside the purview of the government, especially the slum redevelopment board. While a number of solutions exist for low-income households that adopt alternative materials, technologies and designs, the most vulnerable housing typology of blue tents is not dealt with.

**HOUSING FOR URBAN MIGRANTS (H.U.M)**
focuses on type 1, type 2 & type 3 homes that fall into these segments
THE COMMUNITIES

Stability of livelihood
Quality of dwelling
Tenure security
Longevity of existence
Stability of livelihood
Quality of dwelling
Tenure security
Longevity of existence

Vulnerability

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Today blue tent homes have become a part and parcel of the city landscape. Their existence seems to have become a socially acceptable occurrence, one that we are unconsciously festering and pushing towards permanence. Their living conditions coupled with lack of opportunity has also lead to a cycle of poverty, giving rise to frustration and in turn increasing crime rates and mistrust.
Blue tent communities are complemented by deplorable living conditions, firewood smoke, insecurity and complete lack of access to basic services. Most often than not they are labourers, rag pickers and domestic helps, looking to make a living.
HOUSING TYPOLOGY STUDY

1. NON-INCLUSIVE DEVELOPMENT

Imbalanced housing plans do not consider the needs and demands of the MOP, invariably pushing them on the pathway to becoming slums.

2. LACK OF OPTIONS IN HOUSING

While a number of solutions and services exist in the fields of health, education, water and energy access; housing solutions are limited. Families earning less than INR 8000/month cannot access conventional housing services.

3. VULNERABLE LIVING CONDITIONS

Most often, families live on encroached or litigated land where they are forced to adopt not only a temporary lifestyle but also one that is ow-profile & inconspicuous, for fear of attracting ‘legal’ attention and increased rents.
IDENTIFICATION OF ISSUES

Core Problem
Inhumane living conditions

Direct symptoms
- Space constraint
- Indoor cooking smoke
- No drainage
- Lack of hygiene + insects
- Lack of security & protection

Underlying symptoms
- No privacy
- Ill health

Contributing Factors
- Doing what everyone does
- Learning from each other
- No space in the city
- Lack of urban planning

Direct causes
- Spending little money
- Migratory nature
- Inexpensive solution

Underlying causes
- Lack of awareness/opportunity/information
- No other option present
- (fuel/housing/material)
- Land owner issues

Contributing Factors
- Political, land-owner, mafia issues
- Need to be inconspicuous
- Behavior is hard to change
- Aspire to earn/survive
- Living conditions don’t matter

Housing For Urban Migrants
The HUM Project, in its essence, aims to provide viable options for housing / shelter / built environment to vulnerable urban poor communities. The design aims to deliver a significant improvement in the living conditions of people by providing ample amount of natural light and ventilation, improved indoor air quality, security and protection from pest and rodents, thereby increasing the livelihood productivity and providing a healthy environment safe for inhabitation.
JUST ANOTHER HOUSING PROJECT?
The HUM project is designed to be versatile, hands-on solution for immediate effect. The larger goal of the project being to keep a check on slum formation – and mitigate the effect.

OUR APPROACH

SOCIAL SCENARIOS
Solutions that can be used to cater to the varying short term and long term housing requirements.

PRODUCT
Individual components (door, window, frame etc.)

+PACKAGE
Complete kit of parts to build a home

+TECHNIQUE
Improving by imitation

DESIGN REACH
A variety of ways in accessing a part or the whole of a housing solution allows for maximum outreach, catering to a variety of needs.

FINANCIAL MODELS
Financial models can be suited to the varying factors of duration of stay, location and financial capacity of the end user.

Housing For Urban Migrants

OUR APPROACH
PRODUCT EXPLORATIONS

Housing For Urban Migrants

PRODUCT SOLUTIONS
PROTOTYPE 1

- Use existing material palette of the Community
- Adapt to familiar construction technique
- Use easy to source products
- At the same time, improve ventilation + lighting + spatial efficiency + comfort
The prototype was built with community participation on one of our project communities at the cost of 75$ in two days. As you can see, the materials and techniques used were all local.
ACHIEVEMENTS

- Locality available materials
- Basic tools
- Ease of transport
- Long Life-span
- Affordability
- D.I.Y.
- Easy comprehension
- 2 people assembly
- Quick assembly
- Movable
- Participatory Building
- MJ/kg
- Low embodied energy
- Spatial integration
- Natural Light and ventilation
- Modular
- New materials
- Adaptability
- Tool-kit of solutions
- Distribution model
- Financial profitability
- Standardization
- Thermal Insulation
- Photovoltaics
- Rodent proof
- Healthy environment
We can't afford a new house, can you improve our existing house?

The landlord charges us a higher rent if we improve our house.

We can't afford a new house, can you improve our existing house?

We wish if we could use better materials than what we find at our workplaces.

We have less smoke in the house.

Ours neighbours look up to us.

The frame is too flimsy to bear the weight of anything hung on it for storage.

We could never imagine having windows and use tarpaulin sheet at the same time.
PROTOTYPE 2

- Prefabricated dismantle-able modular frame
- Off-the-shelf durable materials
- Built – in Clean Cooking Stove
Prefabricated Dismantle-able Deal Wood Frame

This one is a prefabricated wooden frame compatible with the existing construction waste and materials available to construction workers on their sites. The structure is currently on field.

Cost: 240$
Prefabricated Dismantle-able MS Frame

A different structural shape was explored with prefabricated MS Frame to increase durability and longevity.

Frame
Square Section Metal Frame

Roofing
Tarpaullin Sheet
Cardboard
Split Bamboo Frame

Front Wall
Chipboard
Deallwood
Umbrella Fabric

Back Wall
Chipboard
Canvas

Doors and Windows
1. GI Sheet Pivot Door with Deallwood frame
2. Deall wood Frame window with Polycarbonate Shutter fixed to Chipboard.
3. Bamboo Frame backed with Mosquito Net.

Flooring & Parapet
PCC Floor
Curl, Block Masonry

Additions
3 vessel TIDE Mud Stove
Shelf

Cost: 250$
ACHIEVEMENTS

- Locally available materials
- Basic tools
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- Healthy environment
I stay in the city only for a few months in the year, I don’t want to invest much in making a house

Your house is too different from our usual house. It attracts too much undue attention from the landlord. He would think that we are settling here permanently by the look of your house. He will evict us

Our landlord will never allow this to be built on his site

Too much luxury for us. We ought to be living frugally so that we send maximum money to our village

The cost of transporting this house on a truck to another location is enough for us to build our normal house.
Going back to the drawing board – we decided to develop a prefab option for financial models where the end user does not own the unit. This option was particularly suitable for entrepreneurs who can charge rents and development agencies who can fund a subsidized upgradation project.

Cost: 250$
Housing For Urban Migrants

**PREFAB OPTION**

**METAL FRAME**

- **ROOF**: Any water repellent fabric (tarpaulin/canvas/nylon/flex) tied to frame by ropes, backed by Cardboard/ PVC Net.
  - Size: 12’ x 20’

- **FRAMEWORK**: 1” SHS 19 gauge MS Frame.

- **FRONT WALL**: Dealwood Pallets backed by FRP Sheet.
  - Size: 3’6” x 6’

- **BACK WALL**: Laminate Board/ Chipboard/ GI Sheets.
  - Size: 3’8” x 8’

- **FLOORING**: RCC / Mud Flooring
  - Size: 8’ x 10’

- **VENTILATOR & SUN SHADE**: Metal Grill & GI Sheet
  - Size: 2’4” x 7’; 2’4” x 1’

- **LIGHT WALL**: Translucent FRP Sheet
  - Size: 3’11” x 1’4”

- **DOOR**: Flat GI Sheet fixed onto Dealwood Frame
  - Size: 2’ x 5’6”

- **WINDOW**: PVC Mosquito Net and Translucent Plastic Sheet fixed onto Dealwood Frame with Bamboo grills
  - Size: 5’11” x 1’ & 0’ x 1’

- **PARAPET WALL**: Concrete Block Masonry
  - Size: 4’11” x 1’ (6’ above ground)

**ADDITIONS**

- Mud Stove
- Storage (Water, Food, Valuables)
- Water Purifiers
- Soil Pit
- Bath Area
- Solar Lights
- Earthen Fridge

**Cost**: 250$

**DEALWOOD FRAME**

- **ROOF**: Any water repellent fabric (tarpaulin/canvas/nylon/flex) tied to frame by ropes, backed by Cardboard/ PVC Net.
  - Size: 12’ x 20’

- **FRAMEWORK**: 4’x 3/4” Dealwood Frame.

- **FRONT WALL**: Dealwood Pallets backed by FRP Sheet.
  - Size: 3’6” x 6’

- **BACK WALL**: Laminate Board/ Chipboard/ GI Sheets.
  - Size: 3’8” x 8’

- **FLOORING**: RCC / Mud Flooring
  - Size: 8’ x 10’

- **VENTILATOR & SUN SHADE**: Metal Grill & GI Sheet
  - Size: 2’4” x 7’; 2’4” x 1’

- **LIGHT WALL**: Translucent FRP Sheet
  - Size: 3’11” x 1’4”

- **DOOR**: Flat GI Sheet fixed onto Dealwood Frame
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**ADDITIONS**

- Mud Stove
- Storage (Water, Food, Valuables)
- Water Purifiers
- Soil Pit
- Bath Area
- Solar Lights
- Earthen Fridge

**Cost**: 220$
MORE LOCAL EXPLORATIONS

Hoodie

Airsheets

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PRODUCT SOLUTIONS
PROTOTYPE 4
Local Skills and Materials + Prefab Components + Eco friendly Building Materials + Customization + Natural Light and Ventilation
• Non Modular
• Not scalable and replicable in high volumes Cost: 120$
ADAPTATIONS – HUM + INTEGRATED ENERGY CENTER

The house cum kiosk of an operator for a community solar charged battery portable lights distribution system in a community in Bangalore.
PRODUCT: SKIN EXPLORATIONS

- Reduced Product Weight – Greater degree of Portability
- Focus on skin rather than frame – Portability at lower costs

- Highly Replicable and Scalable
- Standardization of product for dissemination in the free market
SKIN EXPLORATIONS

• More flexible in terms of usability on varied frame sizes
• Less Stitching – More Water Proof
• Ease of fabrication and installation
• Net savings in costs
H.U.M Skin

1. Housing For Urban Migrants
H.U.M Skin

- Outer roofing sheet
- Inner roofing sheet (not seen)
- Window
- Wall sheet
- Smoke extraction hood (Add-on)
- Parapet + Floor (Add-on)
- Pet bottles filled with turmeric, envelope foundation part of the casuarina pole to prevent termite growth.

(recommendation)
H.U.M Skin
Detailing for production

- Inner roofing sheet (100GSM tarpaulin)
- Vent (mosquito netting)
- Outer layer of skin (PU coated nylon)
- Window flap (PU coated polyester)
- Window (mosquito netting)
- Eyelets (plastic)
- Inner layer of skin (tarpaulin)
- Line of stitch
- Tie (preferably cotton strip)
- Insulation pockets
- Old paper/used cardboard/packaging material
- Outer roofing fliesheet to be secured with rope (200 GSM Silpaulin)

Sides bound together by jute rope
H.U.M Skin
Scaled down prototype
COMMUNITY ENGAGEMENT & COMMUNICATIONS TOOLS

Card Sort
Understanding priorities and expenses

Flash Cards
Awareness
Local Solutions for Housing Regeneration:

Ventilation Experiment Kit

Natural Sunlight Simulation
UNDERSTANDINGS

• Net Effectiveness of the Natural Light and Ventilation Interventions are directly correlated to the cooking habits and choice of fuel. **Cracking the clean cooking issue** sensitive to local cultural practices will directly impact indoor air quality and success of NLV interventions

• An intensive Community based Human Centric Design approach is key to understanding **community preferences and priority**. Community Awareness and participation is imperative to the success of a housing intervention. Currently housing is low on priority within these communities. **Livelihood and Employment highest on priority.**

• **Social Dynamics of Casteism, Politics and Regionalism, Cultural backgrounds and practices** directly influences adoption trends of solutions more than the actual design and workability of the product.

• Living in close knit groups inculcates a sense of security against evictions, trouble from law enforcement agencies. The sense of **identity as a community** ensures Women and child safety, addressing disputes, and access to water and electricity.
UNDERSTANDINGS

• Landowner is the single most pivotal stakeholder. Therefore, incentivizing and involving the landowner actively in the intervention is the key to the success of the project. The informal symbiotic arrangements currently between the landlord and the community should be reduced of its risks for the benefit of both the parties.

• Financial Modelling:

Entrepreneur/NGO led renting system > User Ownership > Landlord Ownership led renting

User Ownership directly linked to livelihood. Focus on livelihood and employment creation directly affects user ownership levels and overall adoption rates

• Urgency and scale of the housing crisis for the most vulnerable requires quickly replicable and scalable solutions and processes, implemented through community participatory approach with strong policy push backed by consistent political will and action.
Apart from innovations, the foremost mandate of SELCO Foundation is to establish processes to engender replication and scaling, followed up monitoring and evaluation. 

**PROJECT POTENTIAL**

Policy intervention to provide affordable temporary and immediate housing solutions to the vulnerable seasonal migrants.

Affordable housing solutions catering to this particular strata that ideally renders this project obsolete.