



Sustainable Consulting

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INTRODUCTION

Today in Bangalore, there are 107,917 homes in communities classified as slums. As defined by the Indian registrar, slums are “residential areas where dwellings are unfit for human habitation by reasons of dilapidation, overcrowding, faulty arrangements and design of such buildings, narrowness or faulty arrangement of street, lack of ventilation, light, or sanitation facilities or any combination of these factors which are detrimental to the safety and health.”¹ Within these communities, 609,255 people suffer from high thermal discomfort, limited space and light, and poor indoor air quality which cause physical, mental health, and respiratory problems^{1,2}.

Several non-governmental organizations (NGOs) based in Bangalore, such as SELCO Foundation, FEDINA, and Hasiru Dala, recognize the need to improve living conditions in these low-income communities. They strive to design and build cheaper, safer, and more energy-efficient homes by using eco-friendly materials and construction methods and rejecting the use of concrete.

India is the second largest producer of cement on earth and consumes 98% of what it produces, 65% of which is used to construct homes³. The construction industry additionally accounts for 24% of India’s total greenhouse gas emissions, with cement and steel production as major contributors⁴. By reducing the reliance on cement, these NGOs are also reducing carbon emissions that contribute to climate change, an adverse effect that prevents the most vulnerable low-income and poor urban communities adapting to the extreme heat waves and frequent flooding^{5, 6, 7, 8}.

Thus, the focus of these low-income housing NGOs is two-fold:

1. To improve living conditions through better design and construction
2. To improve living conditions by reducing greenhouse gas emissions and slowing down the harmful effects of current and future climate change.

PROBLEM

These NGOs, focused on low-income communities, note the need to build homes that have structural integrity, provide thermal comfort, and reduce greenhouse gas emissions. **They strive to use affordable and alternative building materials, designs, and methods that, unfortunately, is resisted by the communities they work in due to their beneficiaries’ lack of knowledge and acceptance on their techniques.**

Two of Hasiru Dala’s beneficiaries, for example, have questioned their new home designs because they were not the designs they, their local contractors, or their neighbors were used to. Their new homes were to be constructed with load-bearing walls which does not require the addition of reinforced concrete (RCC) columns that are found in conventional concrete homes. However, community members, including the local contractor did not believe that a home without columns would be structurally sound. In one case, a beneficiary even forced Hasiru Dala to redesign their home with RCC columns, increasing both time and cost of construction and decreasing useable space.

In Ambedkar Nagar’s slum, community members also prefer RCC columns because they believe that it is strong enough to support the construction of more floors, hence allowing them to house their children’s

future families. Even when beneficiaries understand that using an alternative, non-concrete material will make their home cooler and more comfortable, their familiarity with concrete and desire for RCC columns leaves them unwilling to truly accept other options. One Ambedkar Nagar woman, in particular, remained unconcerned about the relative thermal discomfort caused by living in a concrete home. Instead, she claimed that she could easily cool down her home by simply turning on the fan.

All of this community resistance to alternative, non-concrete materials can lead to several weeks of construction delays; strained relationships between NGOs and beneficiaries; added cost and expense; decreased home quality in terms of durability, sustainability, thermal comfort, and space efficiency; and in some cases, withdrawal from a project entirely.

Underlying the fear and skepticism of alternative building materials and methods amongst low-income community members is a lack of knowledge of and familiarity with these other options. This lack of knowledge is in turn a result of a lack of community engagement and/or access to technical information presented in a relevant and understandable way. Oftentimes the NGO outreach workers that identify and meet with beneficiaries do not have the technical expertise and know how to convincingly explain the advantages of alternative, sustainable materials and methods. The NGO architects and designers pushing for the use of sustainable materials, on the other hand, do not have the outreach experience needed to effectively communicate technical information to non-technical audiences and are sometimes not comfortable talking directly with community members.

SOLUTION

In order to enhance community knowledge on alternative construction materials and techniques, housing NGOs working in low-income communities can hire Kotaka, a sustainable consulting firm. Kotaka is the channel that bridges the gap between NGOs and their customers through community outreach.

As a partner, we understand that NGOs sometimes lack the time, technical knowhow, and/or outreach expertise to effectively engage and check-in with their beneficiaries. At Kotaka, we educate and engage with NGO beneficiaries on sustainable materials and practices that will make their homes more affordable, energy-efficient, and environmentally-friendly while also improving their living conditions.

Outreach and Engagement

Our community outreach methods are designed to convey technical information in an understandable way to ultimately convince our client NGOs' beneficiaries to accept the use of better, alternative materials, technologies, and construction designs for their homes. Some of our outreach strategies consists of showing illustrated comparison posters of materials, video walkthroughs of homes before and after NGO intervention, video testimonials from satisfied beneficiaries, small model homes, visual loan comparison charts for different materials, and exposure visits to completed homes (see MVP section for further details).

Monitoring and Evaluation

We also monitor beneficiary satisfaction throughout the construction process using pre-, during-, and post-implementation surveys. This allows us to provide client NGOs with beneficiary feedback and to inform them of possible alterations and improvements that could be made to the building materials and

techniques utilized. The goal of this service is to help NGOs continue to provide satisfactory and successful services in this evolving market. We hope to help NGOs continue to provide satisfactory and successful services in this evolving market.

Evidence for Solution

We spoke to Kaylea Brase who is an outreach specialist from Pure Paani, an organization that provides water filters to low-income communities. She visits urban migrant communities in Bangalore to market these water filters, but frequently encounters initial apprehension. This is generally from people who have never encountered these types of filters before, and are unsure about how effective they are. In her experience, she has found that people respond best to imagery of other people. If someone sees designs of a person using a water filter and staying healthy, and another person not filtering water and getting sick, it allows community members to put themselves in these scenarios, and connect with her message. She also finds community members to act as representatives and positively influence their friends and neighbors. In addition, she encourages children in these communities to learn about the filters and design their own posters to inform their communities. Human-centric imagery and the empowerment of community members to become experts and teachers have been effective methods for her and others.

Another trial called the BABEX Trial was conducted in India to examine the effectiveness of a brief community outreach tobacco cessation intervention. This was a cluster RCT with 1213 participants. The intervention consisted of a single in-person session of tobacco quit advice, and a short training of two yogic breathing exercises which have been proven to control cravings. The advice was given via a script and contained coping training, medication advice, social support, and behaviour change techniques which have been shown to improve quit rates. The study found that a single session community outreach intervention can increase tobacco cessation in low-middle income countries.⁹

These two examples are proof that educational outreach can increase awareness about specific issues and that outreach about sustainable construction methods and sustainable materials will help fill the gap in low-income communities knowledge. This outreach will help prevent community backlash against NGOs designs and will help the NGOs successfully complete their work.

BUSINESS MODEL

Customers

Low-income, sustainable housing NGOs

Our customers are NGOs trying to improve the living conditions of low-income community members by constructing quality, eco-friendly homes for them. Examples of these NGOs are SELCO, Hasiru Dala, and FEDINA, who hire us to help them promote sustainable materials and designs that are new to these communities, but will help improve the comfort, safety, and energy efficiency of their homes.

Material Vendors

A second customer segment we have are material vendors and manufacturers whose sustainable materials are promoted through our educational programs and an approved vendor list that will be shared with our NGO clients. Sustainable material vendors typically struggle to sell directly to low-income homeowners because of a lack of demand. These homeowners' simply want to build a house that satisfies

their immediate material needs and therefore do not prioritize use of better alternative materials, when traditional ones like concrete can already satisfy their basic needs. The vendors struggle to sell to NGOs because many of them are still in the development and piloting phase, and have not yet focused on marketing or promotion. They are therefore willing to pay for ready-made, targeted advertisement that can get them more customers and potential construction partners to pilot with.

Beneficiaries

Our beneficiaries are the low-income residents with whom we are engaging. They benefit from our services by gaining knowledge about better, alternative sustainable materials and designs and ultimately accepting them in the construction of both their neighbor's and their own new homes. Upon acceptance of these alternative materials, they will also benefit from a higher-quality, more thermally comfortable, safer, more spacious, and less expensive home that helps reduce the impacts of construction on climate change.

Financials

We have two sources of revenue: (See Appendix X for financial details)

1. Usage fee: We charge our NGO customers a 6 month per project fee for our consulting services.
2. Advertising: Through our outreach we promote specific material vendors and manufacturers whose products align with the values of our customer. We advertise their products in these communities, and as a result our customers buy their materials. We collect monthly advertising fees for promoting their products.

IMPACT

Successful outreach and effective education on the benefits of low-cost construction utilizing sustainable building methods and materials will have far-reaching positive impacts in low-income communities. One of our NGO customers, SELCO, currently has their first 10 pilot houses under construction. As a result there is not yet direct data on the energy efficiency or the environmental impacts of the homes. However, SELCO has done past projects building new Anganwadi Centres with similar designs using the same materials as the homes they are building. Anganwadis are single-story daycare centers, with an area of 600ft². The average house that SELCO is constructing has a single floor plan of 300ft², and 2 floors, for a total area of 600ft². Extrapolating from SELCO's data on the Anganwadi Centres, the average house will have energy savings of at least 1.12kWh per day.⁹ The current cost of energy in Bangalore is 6.45 rupees per kWh.¹⁰ If each household saved 1.12kWh per day, then each household would save 7.22 rupees per day, which equates to 2636.76 rupees per year. The average household income for slum dwellers is 15,000 rupees per month, or 180,000 rupees per year.¹¹ SELCO's energy efficient homes with better lighting, ventilation, and thermal properties achieved through innovative design and materials, could thus save beneficiaries nearly 1.5% of their yearly income. On average, SELCO's homes are also 2 lakhs cheaper than an equivalent home built with reinforced concrete columns and hollow concrete blocks.¹² A beneficiary family will save 200,000 rupees initially due to lower construction costs, on top of the 2,637 rupees per year from energy savings. This will free up money for low-income community members to spend on education, health, entertainment, and other important needs and wants.

The energy that is saved by SELCO homes not only saves families a lot of money, but also has huge environmental benefits. The average greenhouse gas electricity emission factor for India is 0.92 tons CO₂ per MWh.¹⁰ Every house that SELCO builds will reduce energy usage by 409 kWh per year on average, which prevents the emission of 0.376 tons of CO₂ into the atmosphere per year. Ideally Kotaka would help NGOs like SELCO rebuild every home in every slum in Bangalore. If this goal was achieved, these communities would save 44,116 MWh of energy per year, and would prevent 40,587 tons of CO₂ from being released into the atmosphere each year.

Over the next few years, SELCO and its partner NGOs plan to build 10 homes at a time. On average, community resistance and resultant redesigns cause 6 weeks of delays per project. Kotaka hopes to diminish these delays through implementation of our community outreach programs. The process to acquire loans for these low-income houses takes SELCO about 6 weeks per house. With 6 weeks saved per project from reduced construction delays SELCO could get loans to 10-15 more houses and could complete the construction of another group of houses. Currently, SELCO can complete 10 homes every 3 months, with a maximum capacity of 40 homes per year. With the help of Kotaka removing construction delays caused by lack of acceptance of designs and materials, SELCO could build 10 homes every 8 weeks, and approximately 65 homes per year, 165% more houses than previously possible. In one year Kotaka could allow SELCO to build 25 more homes than they previously could, which would help save 10.22 MWh of energy and 9.4 tons of CO₂ emissions from being released into the atmosphere. These reductions in carbon emissions don't even take into account the reductions caused by using more sustainable materials like fly ash and bamboo roofing instead of concrete and steel. These reductions will help slow the onset of climate change brought about by carbon emissions from the construction sector.

Community acceptance of low-cost sustainable building materials and methods will also help increase the effectiveness and efficiency of NGOs, such as SELCO. The amount of time needed to convince beneficiaries or to redesign construction on their homes will be greatly reduced if community members already understand the benefits of low-cost sustainable construction. This gives organizations, like SELCO, more time to build new homes and to find better sustainable construction materials and methods. Furthermore, as acceptance and use of green construction methods and materials increases, the cost of using these methods will decrease even further. This will set in motion a virtuous cycle, leading to ever increasing adoption of green methods and materials as they become cheaper and cheaper - ultimately benefiting sustainable material manufacturers, construction companies, homeowners, and the environment alike.

MINIMUM VIABLE PRODUCT

Our MVP is a set of basic educational materials used as outreach for SELCO's current projects (see Appendix III):

| Outreach Strategies | Description | Purpose |
|--|--|--|
| Aspirational Pictures of Potential Homes | Supplemental posters with homes built out of alternative materials (e.g. fly ash, mud blocks, bamboo roof) | <ul style="list-style-type: none"> • Persuades people on the aesthetics and sturdiness of certain materials and structures • Shows them what their future home could look like |
| Load-Bearing vs. Column Structures | Poster comparing the properties and outcomes of certain housing structures | <ul style="list-style-type: none"> • Highlight the comparable qualities and benefits of load-bearing structures • Convince people to refrain from choosing column structures |
| Comparison of 4 Roofing Materials | Poster comparing characteristics of common roofing materials | <ul style="list-style-type: none"> • Give people the freedom of choosing their desired building material • Convince people to gravitate towards using beneficial, eco-friendly roofing materials |
| Before and After Construction of a House | Video of the transformation of homes after implementing housing projects | <ul style="list-style-type: none"> • Help people envision a future where the most desired housing features (e.g. space and water storage) and improved living conditions are attainable |

These educational materials were brought into the 3 low-income communities where SELCO and FEDINA beneficiaries reside: one near Swami Vivekananda Metro Station (Swami), one in Ambedkar Nagar, one near Banaswadi Railway Station (Banaswadi). They were also shown to staff working at the Indian Social Institute. As we showed the beneficiaries and their neighbors the materials, we filled out a community outreach feedback survey (see Appendix IV). We hoped to gauge how closely interpretations of images matched our intended message, to determine if any improvements needed to be made to the materials, and to identify the most effective outreach materials to use in the long run.

Overall, the emphasis on imagery allowed a majority of the people to easily understand our messages and choose load-bearing structures and bamboo roofs regardless of their language. However, there are still opposing responses to be addressed that call for slight improvements to the educational materials (see Appendix V).

We have created a 3 month timeline (see Appendix IX) describing our outreach program, this timeline can be scaled to different timespans. We have learned that it takes an entire week to reach all of the stakeholders in a community due to different working schedules. As a result we conduct each individual outreach method on a weekly basis. The timeline is split up into three main sections: design, construction, and post-construction. The timeline follows the order described above, and includes the production of new outreach materials that can be used for later projects, such as testimonials and construction videos.

WHAT'S NEXT?

Immediately, we will be hiring a local Bangalorean as an outreach specialist, they will be creating outreach materials as well as conducting outreach in the communities. (See Appendix X and XI for job description)

In addition to reaching out to other low-income sustainable housing NGOs throughout Karnataka and finding more material vendors worthy of being added to our approved list, we will also develop new outreach techniques and expand our business model.

New Outreach Techniques

In the immediate future, we will continue to develop other outreach techniques and tools, including the following:

- A hands-on lesson about sustainable materials and construction for kids ranging from elementary to high school-aged, who in turn can strongly influence their parents decisions.
- Virtual reality experiences using an Oculus VR headset, which simulate the experience of visiting completed homes and will generate excitement among community members both to try to the VR headset and to see the completed homes.
- A visual energy savings guide.
- Hands-on material characteristics and strength demonstrations, including lighting materials on fire, immersing them in water, and trying to break them apart to test their strength.

Expanded Business Model

In the immediate future to increase incoming revenue, we will also conduct outreach for sustainable architecture firms focused on building homes in middle to high-income communities. We have already heard from three different architecture firms (Biome Environmental Solutions, Masons Ink, and Bamboo House India) who build homes for these other communities that they would indeed be willing to pay for our services, as they face many of the same community acceptance-related challenges as low-income, sustainable housing-focused NGOs. These higher-end sustainable architecture firms require a slightly different approach to outreach, however. They typically prefer to talk to their clients themselves, but would like to use personalized outreach materials we create (including but not limited to visual material comparison posters, before and after construction videos, aspirational flyers, and hands-on material characteristic and model home demonstrations) to help them do so. They would also want to hire us to convince larger institutional clients to use more sustainable materials through visually compelling, easy-to-understand short reports with detailed information on returns on investment and cost comparisons. Lastly, they have a need for better curation of their social media presence and promotion of their designs on the Internet, which we could also provide for them.

In the longer-term future, we will conduct outreach using the same types of tools for other kinds of sustainability-focused NGOs, including those promoting sustainable water use habits and dry waste segregation and recycling. Because we will know what the most effective engagement strategies are, we will also be able to develop effective outreach tools for similar NGOs in these related sectors. This will require hiring another community outreach specialist with a technical background in these other fields.

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APPENDICES

I. Empathy Map - A.) Homeowners

Empathy Map Canvas

Designed for: Homeowners

Designed by:

Date:

Version:

1 WHO are we empathizing with?
Who is the person we want to understand?
What is the situation they are in?
What is their role in the situation?

Low-income slum-dwelling homeowners who are building/rebuilding their homes and need to choose the best design/materials

GOAL
A home that is comfortable and affordable

2 What do they need to DO?
What do they need to do differently?
What job(s) do they want or need to get done?
What decision(s) do they need to make?
How will we know they were successful?

Identify what home features matter most to them; They need to approve on the building materials being used; Success can be measured through a before/after survey on their comfort level

3 What do they SEE?
What do they see in the marketplace?
What do they see in their immediate environment?
What do they see others saying and doing?
What are they watching and reading?

Neighbors homes, made of concrete with columns and new houses being built the same way, their old home that is insufficient

4 What do they SAY?
What have we heard them say?
What can we imagine them saying?

I don't want to fight this battle everyday (with neighbors about materials)

5 What do they DO?
What do they do today?
What behavior have we observed?
What can we imagine them doing?

Cook. Clean. Laundry. Store water. Stay outside of their house in the alley for much of the day. Watch TV. Live elsewhere while their home is getting built.

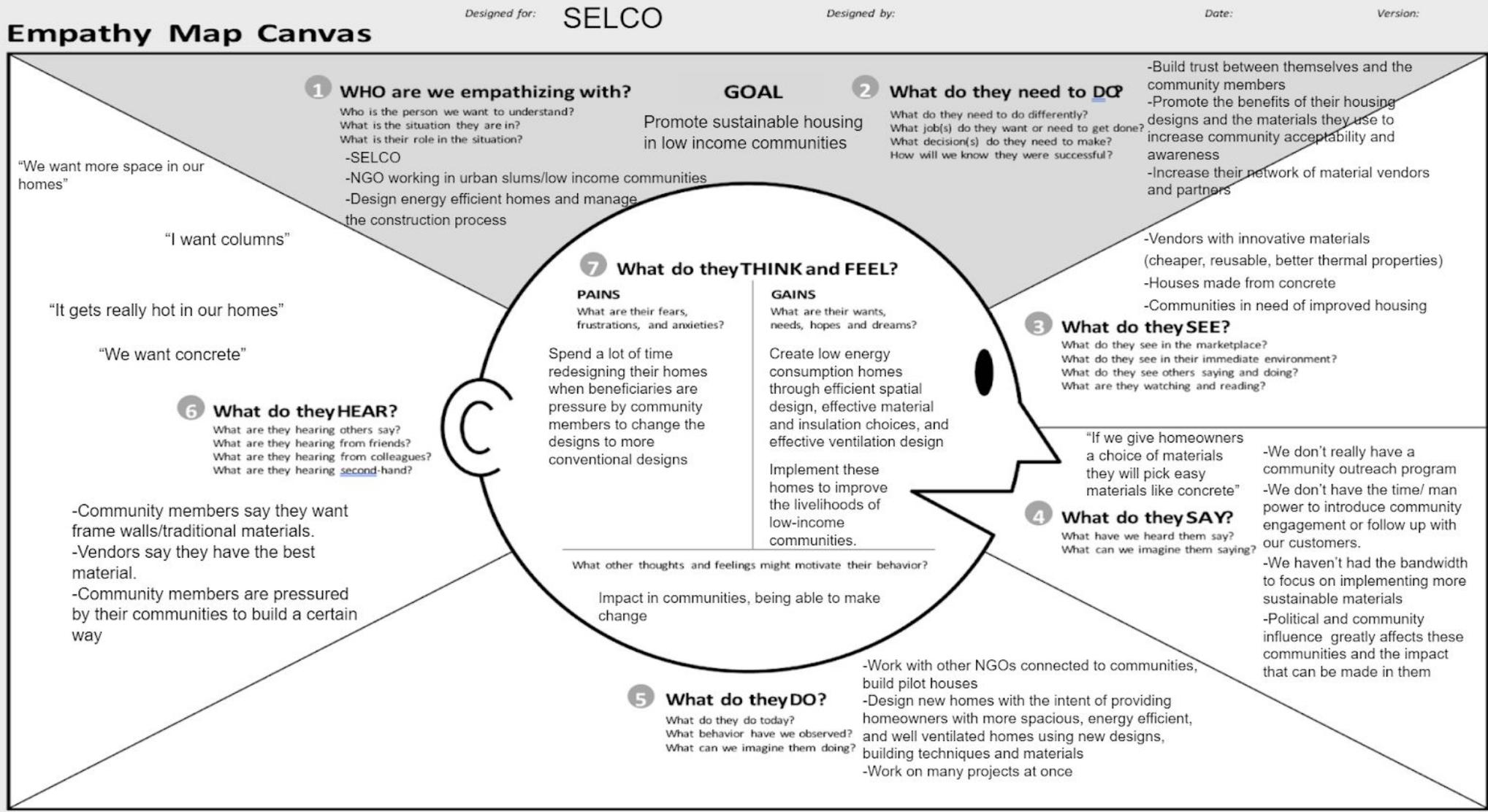
6 What do they HEAR?
What are they hearing others say?
What are they hearing from friends?
What are they hearing from colleagues?
What are they hearing second-hand?

Contractors telling them to use concrete/frame. Neighbors questioning their choice of materials/design. SELCO/other NGOs telling them to use more sustainable mats or mats w/ better thermal properties.

7 What do they THINK and FEEL?

| PAINS | GAINS |
|---|--|
| What are their fears, frustrations, and anxieties? | What are their wants, needs, hopes and dreams? |
| Cost | Enough space and storage |
| Community pressure | House that is affordable |
| What other thoughts and feelings might motivate their behavior? | |
| Might see concrete homes as something to aspire to | |

I. Empathy Map - B.) SELCO



I. Empathy Map - C.) Material Vendors

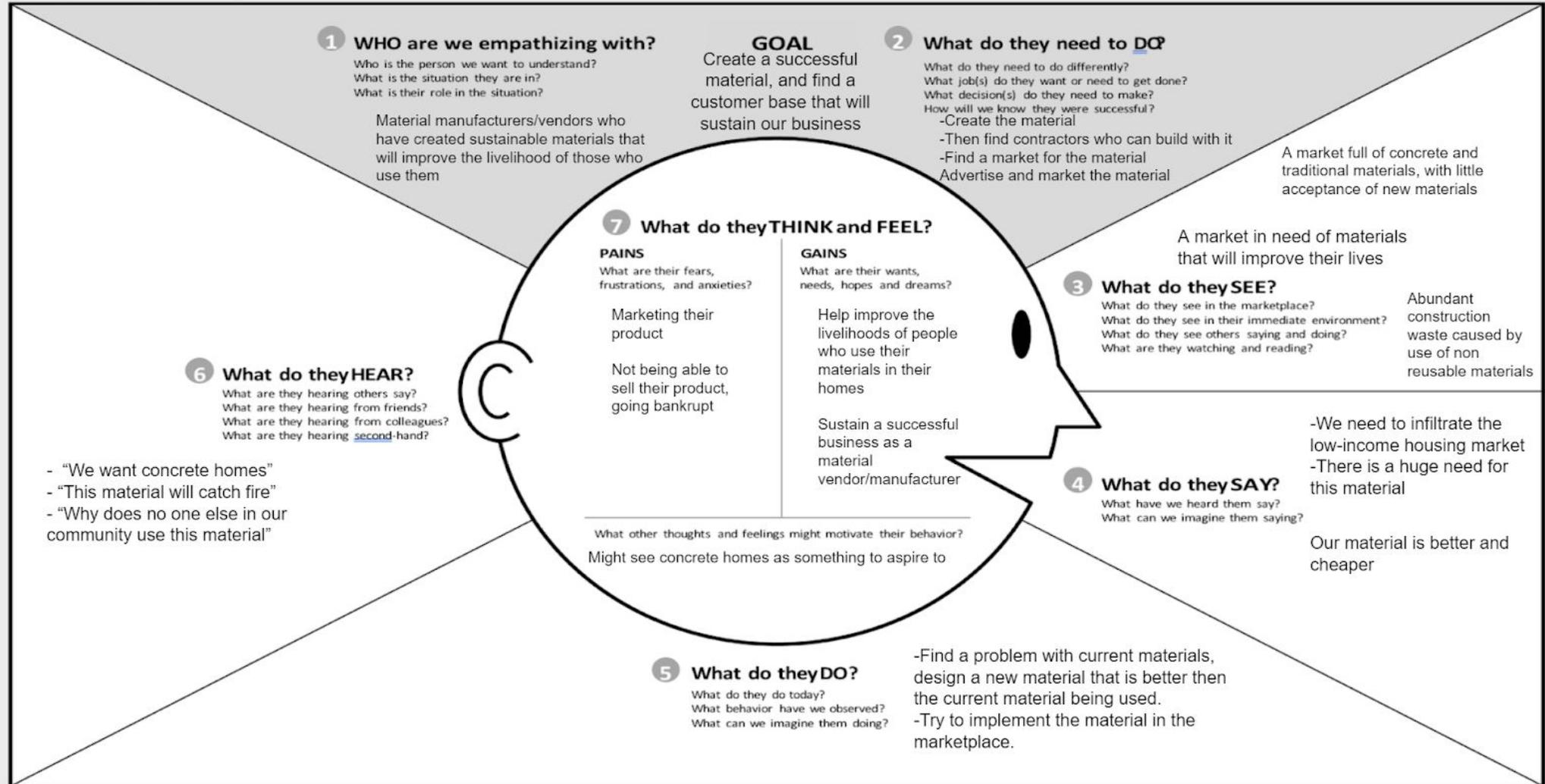
Empathy Map Canvas

Designed for: Material Vendors

Designed by:

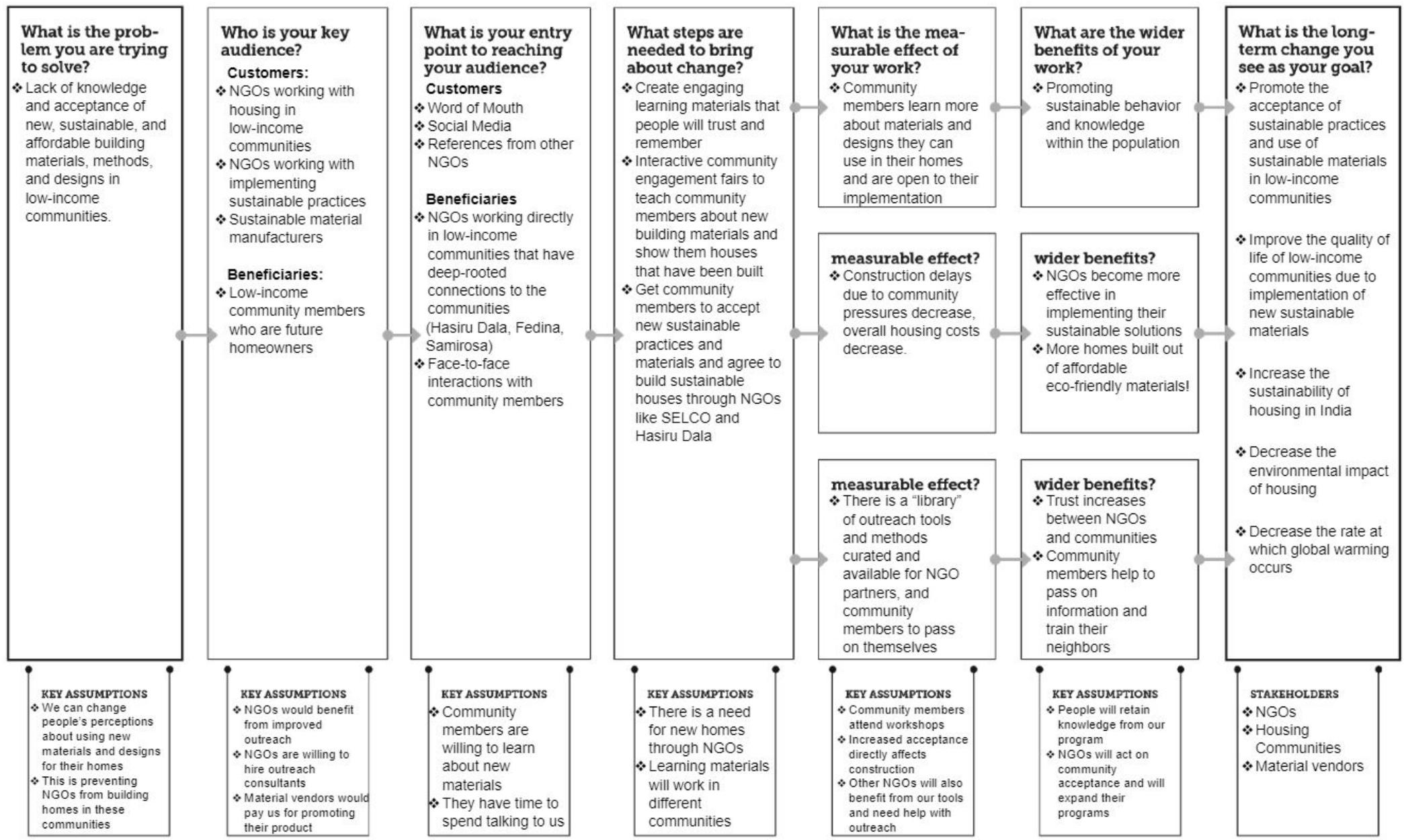
Date:

Version:



I want to clarify my priorities
by defining my goals and the path to reach them

THEORY OF CHANGE



III. Prototype Documentation

Aspirational Pictures of Potential Homes

Fly ash buildings

Load-bearing, no columns



Strong and durable



Saves time, space, money



Mud brick buildings

Strong, durable



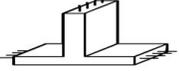
No columns

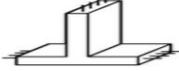


Beautiful, aspirational

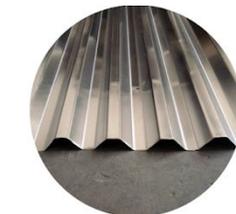
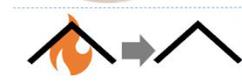
Keeps your home cool and comfortable

Load-Bearing vs. Column Structures

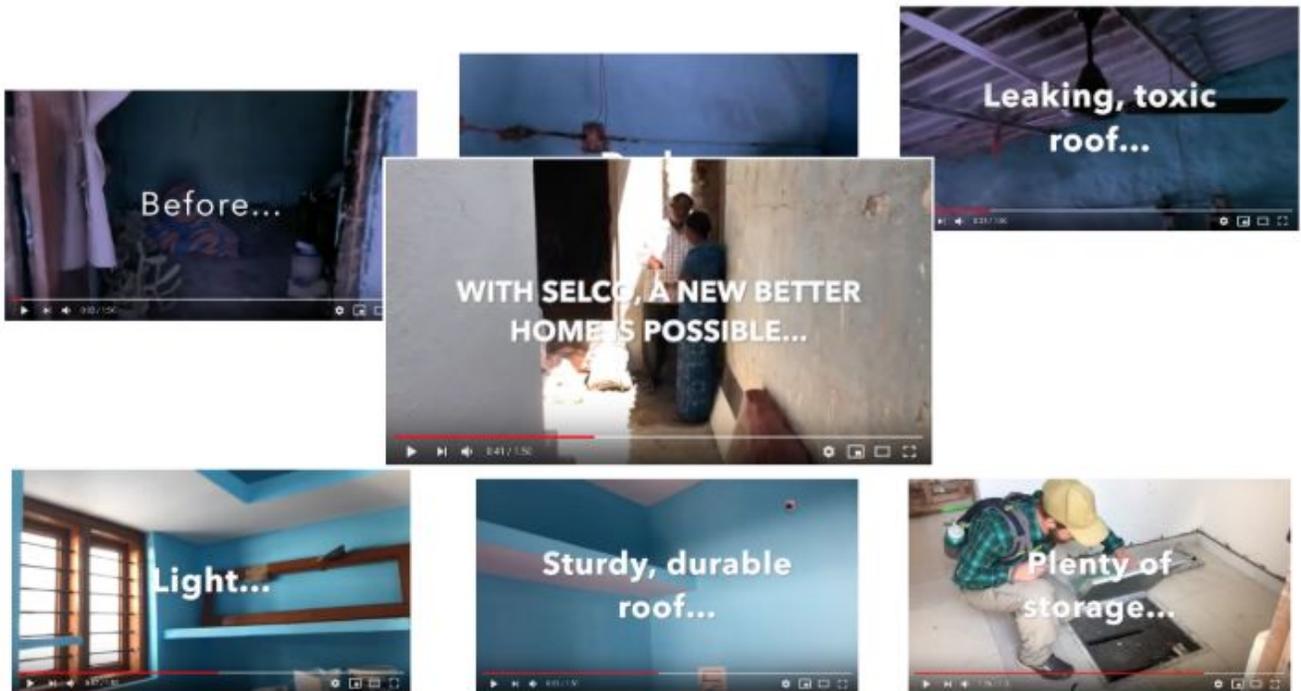
| | Load Bearing Structure | Column Structure |
|------------------|---|---|
| |  |  |
| DURABILITY |  |  |
| COST | ₹ | ₹₹ |
| THERMAL COMFORT |  |  |
| MATERIALS NEEDED |  |  |
| FOUNDATIONS |  |  |
| MAXIMUM HEIGHT | G+3  | G+...  |

| | ತುಕಾ ನಡವಳಿಕೆ ನಿರ್ಮಾಣ | ಖಂಬಾ ನಿರ್ಮಾಣ |
|--------------|---|---|
| |  |  |
| ತಡೆತ |  |  |
| ಬೆಲೆ | ₹ | ₹₹ |
| ಉಷ್ಣದ ಸಮಾಧಾನ |  |  |
| ವಸ್ತು |  |  |
| ಅಡಿಸಾಯ |  |  |
| ಪರಮಾವಧಿ ಉದ್ದ | G+3  | G+...  |

Comparison of 4 Roofing Materials

| | | | |
|---|---|--|---|
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
| ₹₹₹ | ₹ | ₹₹ | ₹ |

Before and After Construction of a House



IV. Community Outreach Feedback Survey

Community Member Type:

Languages spoken:

Community:

Prototypes Shown:

Have you owned a house/will build a house:

Are they willing to learn about new methods/materials? Do they recognize the problem?

| | |
|---|--|
| Do they understand the prototype? | |
| What do these images mean to them? | |
| Have they learned anything new? | |
| Which prototype did they like the best? Which one was most convincing? | |
| Would they like to see anything else? Do they have any suggestions to improve? | |
| What questions do they have about the prototypes? | |
| What questions do they have about the materials/methods shown in the prototypes? | |

V. Prototype Feedback

The 3 types of posters were shown to Indian Social Institute (ISI) staff and the three communities for feedback. Through consistent observations, we have noted the importance of minimizing words and making the outreach content more visual. This allows people to comprehend the posters in the least amount of time, hence allowing us to interact with community members with a busy schedule—a situation we have experienced with the ISI staffs.

These visuals also allow people of all ages and people who speak different languages to comprehend the educational materials. For example, a preteen boy from Banaswadi community claimed he wanted to build his house with a load-bearing structure after he looked at the thermal comfort properties and knew that load-bearing structures would be much cooler. And for one woman from the Swami community and another from Banaswadi, they both gravitated towards the pictures and ignored the words even though they both spoke Kannada and were given the poster written in Kannada. This tells us that the symbols we use must be universally understood and portrayed in ways that reduce misinterpretation and confusion. For example, the column symbol on the load-bearing versus column structure poster remained unknown to people or was interpreted as a house and, therefore, was seen as a more desirable choice. In another case, the deforming roofs in the flammability section on the roof comparison posters were first seen as a good thing.

For the most part, people said they would prefer building with a load-bearing structure over a column structure. But for those who chose column structures, it mainly had to do with their aspirations of having long-lasting structures and having the ability to add more floors to their house in order to hold different generations of family. While we intend to show aspirational posters of completed homes in week 2 of our outreach program, it is important to show aspirational posters again after the comparison posters are shown. While people chose columns over load-bearing structures at first, the aspirational posters allowed community members, who thought the load-bearing mud brick and fly ash homes were made out of columns, to see that load-bearing is similar to column structures. Seeing the aesthetically-pleasing homes that also had strong support convinced people to build homes without the reliance on columns and concrete blocks.

The transformation video received positive feedback from SELCO. They were eager to use this type of outreach strategy and envisioned sending it to potential investors. SELCO talked about their need to show the public their projects and the impact that it can make in hopes of gaining support and persuading investors to fund their projects.

VI. Randomized Control Trial

The Randomized Control Trial to measure the impact of Kotaka within low income communities starts with identifying ten families through partner organizations who are looking to get a new house, and splitting them randomly into two groups. All of the families will be located in different low income housing communities within Bangalore.

The five families identified as part of **the intervention group will be exposed to Kotaka's material education program**, where consultants visit the communities and share with homeowners and their neighbors, which will include simple posters comparing materials and their qualities, video testimonials showcasing homeowners who already have SELCO homes and virtual tours of these homes, and small model homes made with the proposed construction materials. The other five **homes will comprise the control group, and will not be exposed to any Kotaka materials, only the limited outreach SELCO currently does.**

The success of the intervention will be determined by metrics on the construction process such as the **total days construction delays occur due to community backlash, the final cost of the house, and the final design/materials utilized.** Success will also be measured qualitatively through biweekly interviews on **customer satisfaction.**

VII. Story in Seven Sentences - A.) SELCO

Once upon a time there was an architect named Teena who worked for the built environment team at SELCO in Bangalore, India.

Every day she worked hard designing affordable, energy-efficient homes for low-income communities but grew frustrated as she struggled to meet beneficiaries' fluctuating design demands. This required her to repeatedly alter the new building materials and methods implemented in her designs due to the lack of acceptance and trust among the homeowners and their neighbors.

Until one day Teena hired Kotaka Consulting, a sustainable construction consulting firm that executes community outreach and engagement in low-income communities. They helped her NGO promote sustainable practices by educating SELCO's beneficiaries on different materials and methods in a comprehensible manner.

And because of this community members were able to accept and understand the health, safety, and cost benefits of choosing sustainable construction materials and methods that Teena had initially included in SELCO's low-income housing designs.

And because of this the community eagerly learned about Teena's housing designs and had chosen to build SELCO homes without worrying about community backlash.

Until finally Teena was able use the community members' excitement as a motivator to let her creativity fly as she designed new, cheaper, thermally-efficient, and more sustainable homes.

And ever since that day Teena is proud to utilize her skills of implementing sustainable materials and innovation in her designs to help SELCO effectively fulfill its mission of creating affordable and energy-efficient homes.

VII. Story in Seven Sentences - B.) Homeowner

Once upon a time, in a low-income community in Bangalore, India, there was a widow named Deepa who lived with her children in an old concrete home that was too small, hot, and unsafe for her family. After being approached by SELCO, Deepa worked with the NGO to construct a new, more comfortable home.

And every day, she argued with the SELCO designers over how her home should be built. While SELCO planned to use new, cheaper, thermally-efficient materials and methods, Deepa and her community questioned its effectiveness and wanted her home to be built the same way as her neighbors' homes—with reinforced concrete.

Until one day, Kotaka Consulting came and taught Deepa and her neighbors about the safety and benefits of sustainable construction materials and techniques through understandable educational materials, like visual aids and hands-on models.

And because of this, Deepa and her neighbors learned that the new, alternative construction methods and materials SELCO had suggested would allow Deepa to live in a more comfortable, cost-effective, and energy-efficient home.

And because of this, Deepa was able to work with the SELCO designers without any more apprehension from herself or her neighbors, and she was able to select the most sustainable materials best suited for her taste, needs, and budget.

Until finally, Deepa and her neighbors enthusiastically supported the final design and construction of her sustainable new home.

And ever since that day, Deepa and her family has been living comfortably in their new home while witnessing their neighbors work with SELCO to get loans in order to construct their own sustainable, thermally-efficient homes.

VIII. Business Model Canvas

The Business Model Canvas

Designed for: Kotaka Consulting

Designed by: Kotaka Consulting

Date: 2/22/19

Version: 1

Key Partners

- NGOs who are our customers, they are our key partner. Since we are a consulting firm we will be working directly for them, and with them to get their message across and design educational material that suits their needs and delivers their message.
- NGOs who work directly in the communities, these companies will be our direct partners. We need the in order to enter communities and gain trust in the communities

Key Activities

- Production: We will be designing education material based off sustainable materials and practices that our NGOs want to promote in these communities
- Problem Solving: We will be continuously problem solving to determine which methods work best to promote awareness in each community

Key Resources

- Human: The main resource of our company are the consultants who run it
- Physical: We need materials and pilot projects to document and create our education material from
- Intellectual: Once well integrated we will rely on our brand name to get other NGOs to trust us and hire us

Value Propositions

- We provide NGOs with community outreach expertise. We utilize key partnerships to go into communities and promote new building materials and new designs to help NGOs have more success implementing their designs and materials in these low-income communities.
- Through our outreach we educate community members about designs and materials that will make them more accepting of the work that NGOs are doing and as a result their living conditions will improve.

Customer Relationships

Personal Assistance

- We maintain a close relationship with the NGOs we are working with, we work directly with them to develop our teaching material and advertising media.
- We approach the beneficiary through personal assistance by going into the communities, assisted by trusted NGO members in those communities
- We promote our materials online via WhatsApp and social media

Channels

- NGOs who work directly in low-income communities. These companies work on the ground, and have built relationships and trust within these communities
- Word of mouth between NGOs, and social media. NGOs that hire us will refer us to other NGOs that have similar problems and need our services

Customer Segments

Niche Market

- NGOs who are working in low-income communities focusing on improving living conditions
- People in low-income communities who want improved living conditions and want a new home

Cost Structure

Value Driven

- Consultants (wages)
- Transportation costs to communities
- Production costs to create our learning material

Revenue Streams

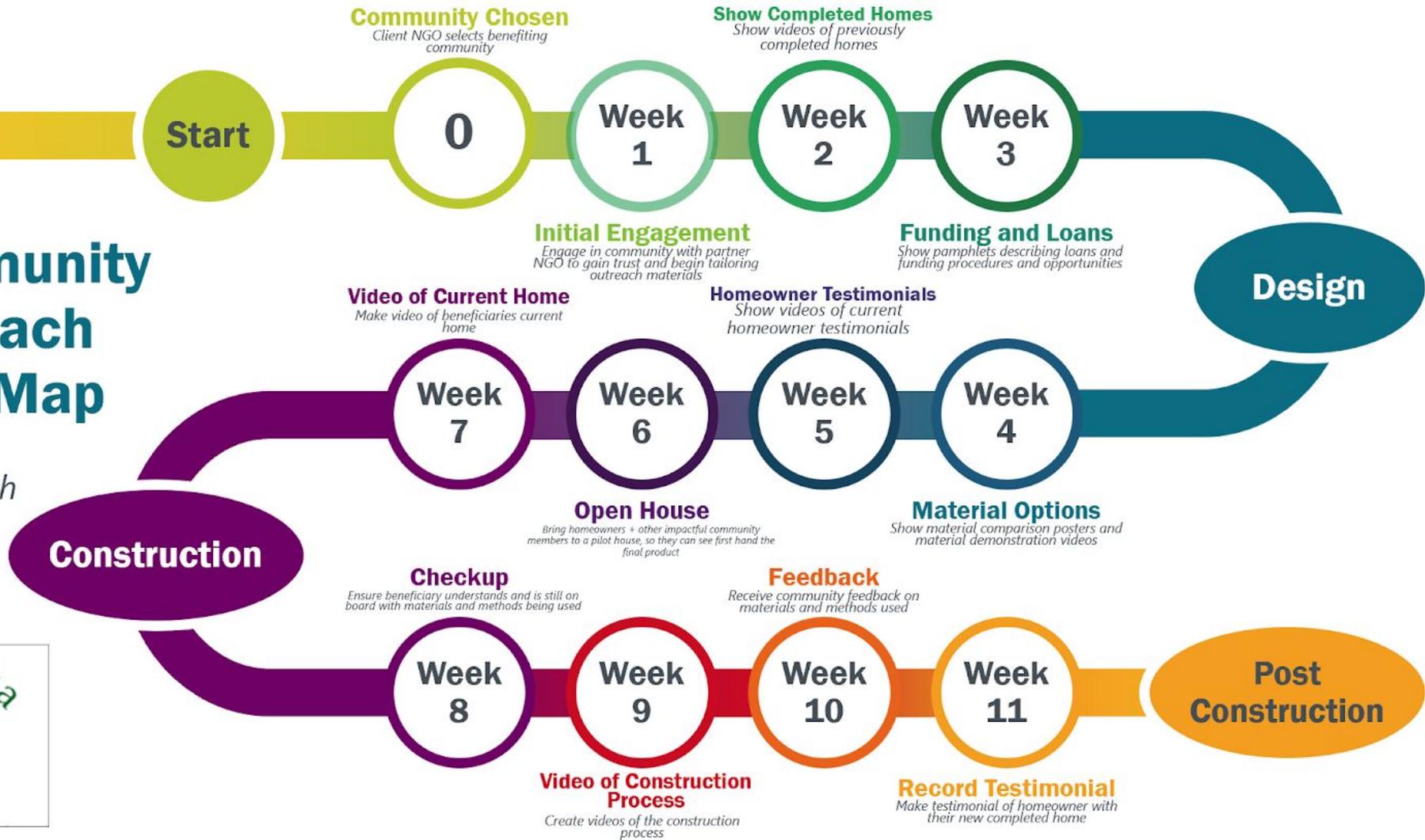
- Advertising: We will be advertising certain materials, we will collect advertising fees for promoting specific products
- Usage Fee: NGOs will hire us to perform our services, they will pay us based on hourly consulting rates, and will provide us with transportation costs and costs to create our education material.

IX. Community Outreach Timeline

Community Outreach RoadMap

2019

Model 3 Month Schedule



X. Financial Value Proposition

Expenses

| | | |
|---|----------------|--|
| (1.2x) Salary for outreach specialist ^{14, 15 16 17} | ₹36,000 | Assuming an above average salary and 20% overhead |
| Poster printing ^{18, 19} | ₹1,800 | Assuming 200 posters printed/month at 9 RS/pg |
| Office space (including internet, electricity, utilities) | ₹0 | Assuming staff can sit at the NGO they're working for at the moment or at home |
| Transportation | ₹9,000 | Assuming 300 rupees/day |
| TOTAL: | ₹46,800 | |

Revenues

| | | |
|--|----------------|--|
| Payment for services from NGOs | ₹70,000 | Assuming 3 NGOs paying 25,000 RS/month each |
| Advertising fees from material vendors | ₹1,500 | Assuming 3 vendors paying 500 RS/month each to advertise with us |
| TOTAL: | ₹71,500 | |

NET REVENUE: ₹24,700

The outreach specialist we will hire will be a native Bangalorean with a background in sustainable construction/architecture, previous experience conducting community outreach, and at least basic graphic design skills. Because of these added qualifications, we will pay an above-average salary for our community outreach specialist. The 25,000 RS/month fee we will charge NGOs for our outreach services is based on the fee that SELCO is willing to pay (5-6% of project costs for a 6-month long project). We assume that other NGOs will be willing to pay similar amounts. Though we have confirmation from 3 material vendors (Eco-Shelter, Bamboo House India, and Swachha Eco Solutions) that they would be willing to pay us to promote their company and be added to our approved vendor list, we were not able to determine an exact amount that we could charge them. We therefore conservatively estimated that they would be willing to pay the small sum of 500 RS/month for active promotion to both homeowners and NGOs.

XI. Job Description

Job Title: Outreach Coordinator and Graphic Designer

What we do and why

In slums that are home to over 600,000 people in Bangalore alone, families are packed together in unfit living conditions that lack proper infrastructure. Asbestos cement roofs leak and decay, flooding homes and filling lungs with toxic particles. Houses are typically one room, 10 by 15 feet, and accommodate at least 4 people. They are dangerously hot, poorly ventilated, and dark, even in midday. Typically, they are made of reinforced concrete, a poor insulator with a high carbon footprint that drives up cooling costs and contributes to climate change. Fortunately, NGOs such as SELCO, FEDINA, and Hasiru Dala have recognized the need for improved housing within Bangalore slums. The alternative building materials and methods these NGOs utilize would greatly improve living conditions, lower costs to homeowners, and reduce environmental impacts. However, community members are often resistant to these unfamiliar methods.

The reason behind this resistance is lack of knowledge. The solution is education. We are Kotaka, a sustainable consulting firm that conducts community outreach for NGOs focused on quality, eco-friendly housing in low-income communities. Our outreach strategies include posters comparing materials, virtual walkthroughs of completed homes, hands-on material demonstrations, and more. We are intent on bridging the gap between these NGOs and their beneficiaries. We also conduct outreach to higher-income customers of sustainable architecture firms to convince them of the viability of green home design.

Currently, community resistance causes an average 6 week delay per housing project SELCO implements, for example. With Kotaka helping to eliminate these delays, every year SELCO could build 25 more homes, improve the lives of 100 more people, and prevent 9.4 tons of carbon dioxide from entering the atmosphere. Reach farther with Kotaka, and look forward to brighter days.

Job overview

The outreach coordinator and graphic designer will be in charge of creating, managing, and curating a library of outreach materials and programs, including but not limited to flyers, posters, videos, scale models, and hands-on demonstrations. They will then use these materials and programs to educate low-income community members about alternative, sustainable building materials and methods that will make their homes safer, healthier, cheaper, and more energy efficient.

Specific duties and responsibilities

- Design and curate educational materials to be used for outreach
 - Create testimonial videos of homeowners from past projects
 - Portray what they like about their new home
 - How they learned to accept the new designs and materials being used
 - Show the benefits of the materials used, and the comforts of the new home
 - Create posters comparing the pros and cons of different materials
 - Create/obtain scale models from the architects of each project

- Update the model to be an accurate visual representation of the house being created
 - Create videos that show the construction process
 - Specifically show how certain materials that we are promoting are used in construction
- Conduct outreach in these communities for every project using the above tool
- Follow up in every community post construction to see how they like their new home and help NGOs and sustainable architecture firms learn from past projects

Qualifications

- Degree in Graphic Design, Sustainability, Communications, or Community Engagement
- Knowledge about Community Engagement and Outreach
- Knowledgeable about slums in India
- Languages
 - English
 - Kannada
- Proficient at video editing
- Proficient at poster design

Working conditions

Will spend time working directly in the field in slum communities around Bangalore.

Will spend the rest of time in client offices curating materials.

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|-----------------------|--|
| Approved by: | <i>Evan Ponto, Shirley Leung, Casey Madill, and Elizabeth Mai (Co-founders of Kotaka Sustainable Consulting)</i> |
| Date approved: | 3/11/19 |
| Reviewed: | 3/11/19 |