



# INTERVIEWS

## DON SAMUEL - 03/11/2015

PRODUCTS: Artesanía (tejidos) y muebles (archivadores, esquineras, sillones, mesas,...)

DEMAND: 3ª y 4ª región de Managua. La gente local de El Rama no tiene aprecio al bambú, no valora el producto.

SELECTION AND CUTTING: Bambú de calidad apto para cortar -> maduro (casi seco, verde). Cuando la luna va bajando no cuando está llena (3/4 días antes o después).

DRYING AND TREATISE: El bambú se cura con un producto químico ácido que lo quema -> Borax

GOVERNMENT SUPPORT: La única ayuda fue la del proyecto de Bambú Social.

TRAINING: Certificado en técnico de bambú.

BINS PROYECT(PART I): Propuesta y diseño.

BINS PROYECT(PART II): No tuvo beneficios con las primeras trece papeleras.

IMAGE OF BAMBÚ: En todo Nicaragua son pocos sectores los que aprecian el bambú, no miran la utilidad que tiene. El extranjero es el que dice "me gusta, me encanta".

"LA GENTE SÓLO PIENSA EN CEMENTO, EN ARENA, EN PIEDRA O EN BLOQUE. NO PIENSAN EN HACER ALGO BONITO CON BAMBÚ".

"LA PERSONA DE ESCASOS RECURSOS APRECIA EL BAMBÚ, PERO OTRA COSA ES QUE LOS PRECIOS SON MUY ELEVADOS Y NO PUEDEN COMPRARLO".

"LA MADERA NO ES LUJOSA Y HAY TIPOS DE MADERA QUE SON LUJOSAS PERO QUE SON CARÍSIMAS, POR EJEMPLO TENEMOS LA MADERA DEL KAOPA."

"EN UN TIEMPO NO MUY LEJANO, CUANDO YA NO HAYA MADERA ENTONCES LAS PERSONAS TENDRÁN QUE COMPRAR BAMBÚ".



**THEODORO 12/11/2015**

Trabajo en la casa de mi papa en una finca agropecuario, el año pasado me relacione a trabajo en la casa de Bambú Social. Me gusta la construcción de la vivienda.

En Nicaragua hay muchas familias con una vivienda no digna. Este cause piloto, es como un posible solución, la falta de viviendas.

El uso de bambú: es un material que desarrollo muy rápido, no tiene tanto años de crecimiento. Es muy sostenible. Mientras contruimos la casa, el bambú crece por reparaciones en el futuro.

Lo harías diferente: La exigencia de los detalles, mas precisión. Ambiente funcional totalmente. Quisas no sacrificar algunas cosas. Bambú: necesita prueba de flexion. Si flexionarse, se garantiza que la construcción queda en el mismo sitio.

Tipos de bambu, mas grande:  
Dendrocalamus asper (columnas). Mas fuerte es el guadua gigantacloa (vigas). Si no es buen guidado no presentación completa. No es un buen desarrolla, mas débil. Por falta de desarrollo y cuidado.

En eso puede ver un efecto, se plantio usarse dos bambu de viga, pero el bambu era muy débil. Quisas poner tres, enforcar. Porque el bambu no tiene la sección muy desarrollada.

La idea de baño seco. Uno de los detalles en el banco no es muy bien. Es muy cerca de la persona. La persona no logra sentirse

comodo. Eso parte se quedo muy cerca de su punto de asiento, la distancia no es adecuada. El parte un poco mas abajo, no puede hay contacto con la persona. Esos son detalles en la construcción, quisas el diseño es bien, pero construcción no, o no plania bien eso punto.

Tanque recolector está bajo de tierra. Esta dificulta la extracción que seca para hacerlo organico. Quisas le hizo asi para la parte dentro de la casa. Mas bien para hacerlo encima de la tierra.

Una distancia considerable para no hay contacto ningun momento con el usuario, si no, no sirve. El desiño distancia adecuada. Es posible sacar de eso por aquí. Una puerta pequeño, puede sacar facilmente.

Para el urin, un filtro para agua grise. Quisas un poco cerca de la casa, pero en general el filtro esta bien. Un poco mas separado de la casa es de preferible. Otro opción para usar el urin en filtro tierral porque tiene potasio.

No le hecho construido en mi casa, creo que es un opcion muy efectivo.

Tubo metalico, recibir calentamiento, ayudo de extraer aire, una función aeromica, no holor.

Mas detalle: las linias del techo, no es en un linia. Error en la construcción fue las columnas no quedaron en un linia. Especial esta columna del parte sur, esta produce mucha problema.

La viga de aquí que soporta el techo, a corro por acá, esta se elevanta. Porque las columnas no queda en un linea total.

Hay que trabajar mas tecnicamente para lograr. Tal vez hay errores porque la mayoría de las personas de los alumnos no eran personas personal cualificados. Entonces esos resultan en errores de construcción.

Bambu tiene mas dificultados, dificultado principal que el bambu no es recto. Quisas es muy dificil pero la opcion de este vigas es un taco de madera, quedo mas en linea. Se tiene esta tacita de madera, y un vara recta, resulta en una mejor vista de la casa.

Ser mas selectivo para seleccionar las varas. No participé en el corte etc.

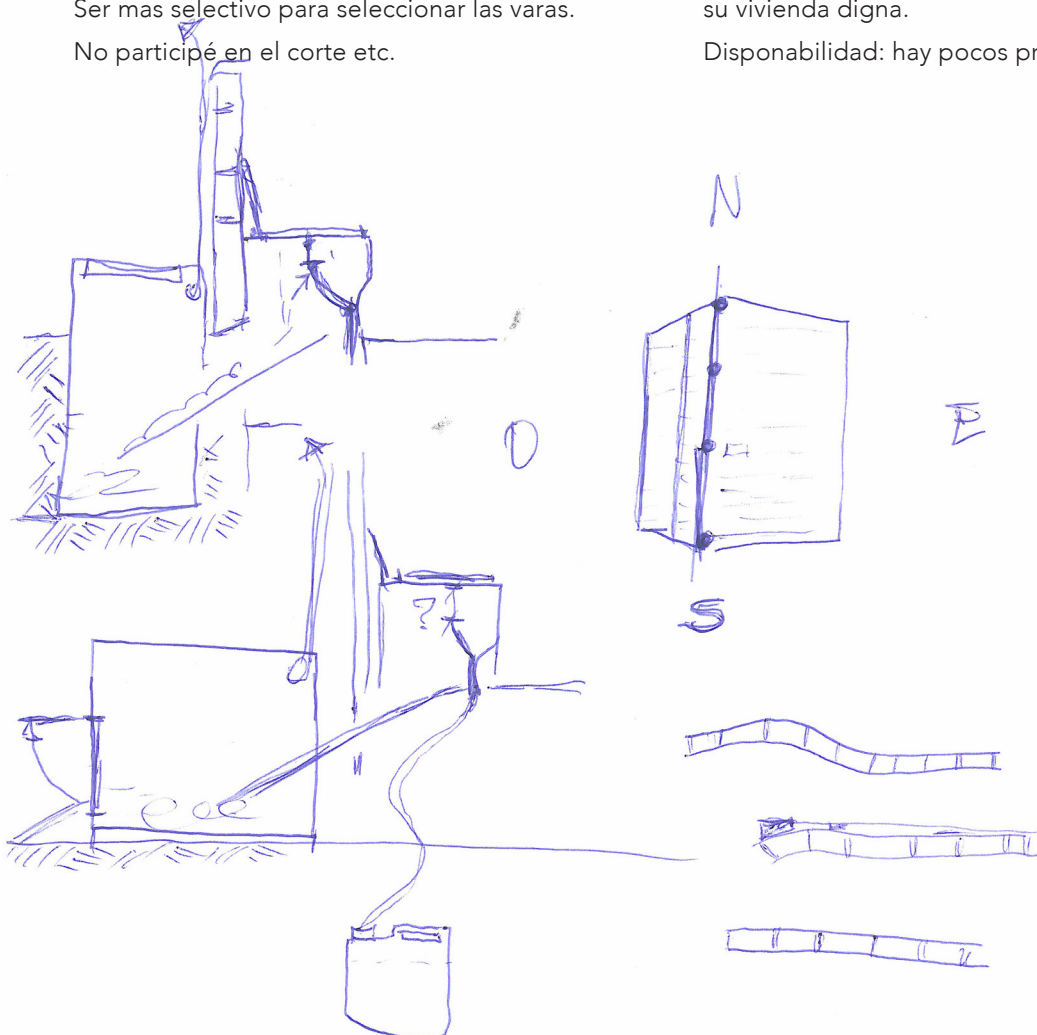
Organización de la construcción. No mucho orientado, no se elaboro en en tiempo. Poco educación, necisitó dedicación.

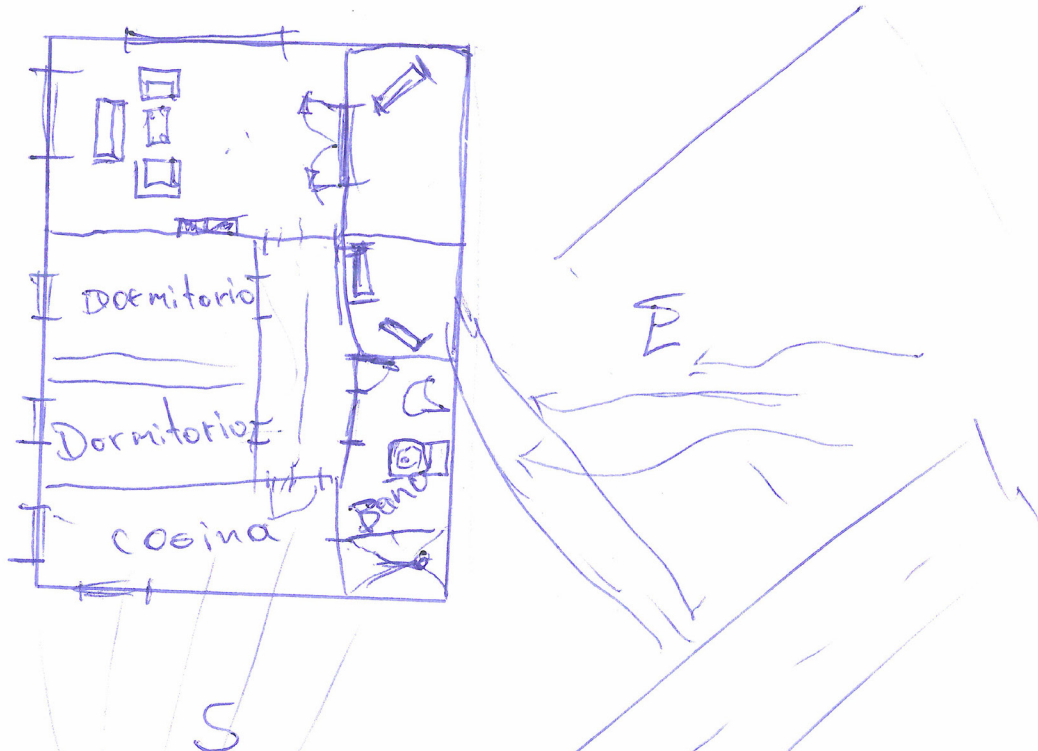
Persona a carga: Laurens, Henky en algun momento, Diana en el jardin, no recuerda mas.

Me gusta mas construir casas que en muebles. La construcción de este casa es primera ves que trabaja de bambú? Sí.

Quiere trabajar más con el material bambu? Si, por el posible solución de la problema de la vivienda, necesito de saber mas. Con un precio asequible para los habitantes que puedan pagar los costos, pueden mantener su vivienda digna.

Disponibilidad: hay pocos productores





de bambu, menos accesible por la bajo producción. Si hay material local, sale mas barata. Debe que ser un punto de construcción, y un lugar donde se pueden acarrearlos (distribuir) el bambu.

El diseño general. Cada persona es diferente, entonces no solo un formato de vivienda, varios personalizados. Varias casas, hacer diferente diseño, pero que tenga lo mismo sostenibilidad como la ecosistema. Sean iguales se función. Ventilación pasiva, eluminación.

Más diseño , no solo un formato pero siempre la funciona ecologico.

Tengo que separar zona privada de la zona pública. Separar lo que es mantener lo espacio optimo. Funcionalidad de ecológica. La vista de la calle, la fuente de dirección del aire, posición del sol.

Todos los necesidades del familia. El planteado es difícil.

Si la sala de esta en el norte, y la entrada siempre en el calle, cocina sol directo (zona humido). -- explicación de la casa -- La casa buen diseñado, todo los funciones. Cocina al dormitorio, fácil.

Veranda es bastante importante, para una casa pequeña es importante. Zona semi privada. Casas mas grande: sala publica y sala privada.

La gente se gusta la parte privado. Cocina por sol -> zona húmida, también el baño. Ruimte tussen dak en 2e verdieping, zijn idee.

House needs to become as cheap as possible, without affecting the basic needs. The walls for example were expensive. Alternative: "electropanel", cheaper. Design must be simple and cheap, sometimes you must sacrifice the sustainable part.

OCTAVIO 4/12/2015



Motivación: inovar en algo nuevo, no solo construcciones de madera y concreto. Me sentido motivado, nunca haria esta experiencia.

De acuerdo con las decisiones tomada?  
Personas en cargo somos ingenierias civiles, no me cuestiona.

Motivation: wanted to learn / be involved in something new, not only in constructions with wood or concrete. I felt motivated as this was the first time.

Were you agreeing on the decisions made?  
Yes the person in charge are architects and engineers, therefore I trust them on the decisions.

Were the opinions of the students asked for?  
With one person from Holland, only his opinion counted, everything has to be

done that way. This had a bad vibe around the team.

Did you feel part of the team? Yes it felt like a family. The whole week I was collaborating, on Saturdays I was studying.

Was it useful for your study? Yes of course, it was an curricular activity and we received an official certificate.

My responsibility: everything. I helped in the garden, cutting and treating of bamboo. I did not have a specific area (work field).

Garden: huge investment (time and money) but a failure, unfortunately. We came up with the drainage system.

Nice experience: that the experience was shared and together you could see how the house was being finished. What the team accomplished is beautiful. I'm proud of my name on the bamboo.

Supervision: the supervision was good and I almost never had to work alone. Most of the members were available. The vibe with Max, Juan and Laurens in charge was good. Afterwards another man came and the ambience changed immediately. He had a strong and serious character.

Prefab idea: the workshop was meant for the project. I thought the tools would be given to the students who were involved to continue the experiments, but in the end the workshop was closed and we didn't know where the tools went.

Future of the house: the thing I knew that it is a library for the BICU. The idea of the library was good, but the internet became more accessible for everyone, so people didn't have to come to the library to get internet. So the idea of the new cafeteria is good for the house, more people would visit the house.

What would you have done differently? The roof, second floor is too close to the roof. With zinc plates absorb a lot of heat, the second floor is therefore unbearable. The guy said it was good for the ventilation, but I don't believe that, it is way too close to the floor. The material is good, but it must be constructed higher.

What else? Make it cheaper. Doesn't fit economically. With the economy like this, people aren't able to save money. A good price would be 30.000 – 50.000 C\$ (2000\$).

Experiments: there were a lot of experiments. With the faeces and sawdust (baño seco). I doesn't serve and a lot of money was waisted.

I would like to continue with working with bamboo.

### JUAN RAFAEL 6/12/2015

Perforating columns make them weaker. In general there lacked some coordination from the manager, the time was not used efficiently and the people worked slowly. He has some comments on the design, but he didn't tell them.

(maybe create a more trusted environment to get feedback from the trabajadores).



Juan Rafael experienced good coordination, every day he had a task and there were meetings in which the changes were discussed.

I would like to make the roof higher, so there is space for a balcony. For a social house the roof is too high.

### JAVIER BALMACEDA 9/12/2015

- Imagínese que usted gana 2000 córdobas al mes, ¿podría decirnos qué oportunidades tiene para construir una vivienda para usted y su familia?

No tendría capacidad para construir una vivienda.

- A día de hoy, ¿de qué manera puede colaborar el gobierno en proyectos de viviendas de interés social? ¿qué políticas y prácticas innovadoras está promoviendo para impulsar la construcción de viviendas sociales?

En la actualidad, hay subsidios en los que la tasa de interés es más baja en el caso de que se quiera construir una vivienda de carácter social.

Existen posibilidades de eliminar o disminuir el impuesto de los materiales de construcción



o negociar precios más bajos con algunas empresas.

Otra alternativa es el adelanto de la liquidación de una persona trabajadora que tenga incentivos acumulados para una liquidación temprana y con eso poder pagar una prima para la construcción de una vivienda.

- ¿Y en cuanto a las políticas que promueven otras instituciones como CEPRODEL (Centro de promoción del desarrollo local) o el Instituto de la Vivienda Urbana y Rural (INVUR)?

Son parte de las políticas de gobierno. En el caso de INVUR, ofrece algunos subsidios o eliminaciones de impuestos. De acuerdo a la demanda de la población, también hay algunos programas como cooperativas para acceder a algunos recursos propios del gobierno (por ejemplo, un lote de cemento). En el caso de CEPRODEL, las tasas de interés son mucho más bajas para la construcción de viviendas.

-¿Cuáles son los requisitos que se exigen a las familias que quieren solicitar esos subsidios?

Para el tema de financiamiento de viviendas se exigen familias que tengan unos ingresos familiares de entre 3000 a 6000 córdobas como salario mínimo. Es decir, unos ingresos promedios familiares de 8000 córdobas. Si la familia no tiene esos recursos, el gobierno nacional en coordinación con el grupal puede subsidiar una parte de la vivienda, no como financiamiento sino como donación.

- ¿Qué relación tiene la Alcaldía con La Palma de Kukra y la Palma de San José? ¿Cuál es el plan?

En el caso de esas empresas hay donación de servicios o de cobro de impuestos sociales. En algunos temas específicos la alcaldía puede utilizar a los trabajadores de La Palma. También hay algunas alianzas en cuanto a algún proyecto social como en el tema de captación de aguas o capacitación de sus trabajadores.

- Cómo es la tradición del uso del bambú en Nicaragua?

En Nicaragua la tradición del bambú es poca. En las regiones donde abunda el bambú, como en el caso de El Rama, se utiliza para la construcción como andamios u otros soportes y en algunos casos para viviendas, cercos, etc. En las zonas del pacífico se usa más para elaboración de artesanía (canastas, muebles, etc.) al contrario que en la zona sur.

- ¿Cómo explicaría el potencial del bambú para los próximos años?

El bambú es un elemento que puede ser importante para varios temas como la



construcción de viviendas, la construcción de muebles y artesanía combinado también con un potencial turístico y comercial. Pero aún nos hace falta crear una cultura del bambú. Todavía hay mucha gente que asocia el bambú como un material para la gente pobre, no se ha divulgado bien el potencial que tiene.

- ¿Cree que puede convertirse en una buena alternativa para el desarrollo de viviendas sociales en Nicaragua?

Es una buena opción. Teniendo en cuenta la experiencia que hemos tenido en algunas construcciones, creemos que puede ser una solución no sólo para las familias pobres, que necesitan construir de manera rápida, sencilla y de bajo costo. Hay que analizar verdadera sino también para familias Ver el costo de estos materiales

- Le hemos oído decir varias veces que quieren impulsar el bambú como un atractivo turístico o señal de identidad de El Rama ¿cuentan con algún plan estratégico?

Es una manera de ir promoviendo El Rama con una marca que lo identifique. Creemos que el bambú puede ser una marca porque es nativo de la zona y no lo tienen en otros municipios de Nicaragua. Además ya mucha gente sabe usarlo de manera artesanal y puede ser un potencial turístico y comercial.

La idea es organizar un tour por El Rama en el que los turistas conozcan las variedades del bambú a través de un recorrido por el río y lleguen al Parque Natural de El Recreo donde se encuentra el taller de artesanía en el que podrán comprar souvenirs, muebles o incluso varas de bambú directamente.

- ¿Cree que el primer paso se dio con el proyecto de las papeleras de bambú y la casa modelo?

Claro, son los primeros pasos pero no podemos dejarlo ahí. Debemos de continuar con la sensibilización a nivel local y luego fuera de El Rama.

¿Cómo fue la experiencia de haber trabajado con Bambú Social?

La experiencia fue muy enriquecedora, porque además hubo un intercambio de conocimientos, de culturas,... Nosotros a Bambú Social no lo vemos como un simple grupo de jóvenes arquitectos que llegaron al El Rama para trabajar varios meses. Es un conjunto de personas y sistemas, personas que capacitaron, infraestructuras que quedaron... todo eso es Bambú Social. El hecho de que personas de otros países vengan a crear conciencia en la población acerca del aprovechamiento del bambú hace que nos cambie un poco la mentalidad.

- ¿Qué opina del resultado? ¿Cuál fue el impacto social de ambos proyectos?

El impacto social de la casa modelo tuvo más repercusión en el entorno de la BICU y en la población estudiantil. Esperamos que con el tiempo sea más atractiva y otras personas tengan conocimiento de la casa modelo, incluso para personas que vengan de fuera del municipio.

Las papeleras también tienen su función como algo autóctono, nuevo y turístico pero hay que darle el uso correcto. Aquí hay otro consenso con la población, para que empiecen a reciclar la basura que lleva en sus manos.

- ¿Por qué a día de hoy sólo se han terminado 13 papeleras y no las que se acordaron en un principio (50)?  
Hemos tenido varias dificultades. No se calculó bien el tiempo que se iba a necesitar para elaborar una papelera (materiales, tratamiento, construcción, etc.). No fue por falta de presupuesto. Todo son experiencias pero creo que se está anunciando la construcción de otras papeleras para completar las 50.

- En los próximos días la casa modelo se convertirá en una cafetería ¿cuál es su opinión al respecto?  
Creo que hay cosas que hay que mejorar en cuanto a la casa modelo, como el servicio sanitario. A pesar de que la biblioteca es bonita, ahora con el internet la gente apenas va. Creo que una cafetería le va a dar mayor impulso a la casa y recibirá más visitas. La idea de ir a tomar un café o un refresco atrae más a los habitantes de El Rama.

### CEPRODEL 11/12/2015

Este año se han suspendido las financiaciones debido a que hay un % de mora bastante alto. El objetivo de CEPRODEL no es expropiar las viviendas sino cancelar las deudas.

En enero está previsto comenzar a dar financiamiento para la construcción de nuevas viviendas y el mejoramiento de viviendas.

CEPRODEL es una micro financiera cuya sede está en Managua pero que tiene

oficinas por varias regiones de Nicaragua. El director ejecutivo tiene bastante interés en El Rama. que se distingue de las demás por su carácter social, no buscan beneficios. Tiene la tasa de interés más baja del mercado y son los más flexibles.

Los fondos de CEPRODEL provienen de la DGIH, una ONG americana que cuenta con una cartera de 8 o 9 millones de córdobas. También está mancomunada con el hermanamiento de Maastricht, la cual ofrece la asesoría técnica y la formulación y ejecución del proyecto. CEPRODEL es la fuente de financiamiento.

Existen alianzas entre CEPRODEL e INVUR en proyectos de construcción de viviendas en los que INVUR destina unos 2000\$ por cada vivienda.

La capacidad de pago tiene que ser equivalente a un salario de entre 8000 y 10000 córdobas mensuales (de 280 a 300 \$). El salario mínimo es inembargable.

La tasa de interés actualmente está al 18% anual con fondos propios (con convenio estuvo al 13%) y el periodo de amortización



depende de la capacidad de pago de la persona que está solicitando el préstamo.

Por ejemplo, si una familia quiere un préstamo de 6000\$ a 5 años va a quedar pagando una cuota de 155\$ mensuales.

Ofrecen financiamiento para viviendas cuyos costes oscilen entre los 1000 a 10000\$. A partir de los 2500\$ ya se considera hipoteca, no garantía y tiene que estar escriturada.

### HENKY BORGSTEIN 12/12/2015

- Imagínese que usted gana 2000 córdobas al mes, ¿podría decirnos qué oportunidades tiene para construir una vivienda para usted y su familia?

No tendría capacidad para construir una vivienda. Con 6000 córdobas incluso no da ni para poder estudiar. Una familia necesita de promedio unos 14000 córdobas al mes para cubrir sus necesidades básicas. A partir de 6000 córdobas ya se considera un buen salario y ni con eso se puede ahorrar para construir una vivienda.

- A día de hoy, ¿de qué manera puede colaborar el gobierno en proyectos de viviendas de interés social? ¿qué políticas y prácticas innovadoras está promoviendo



para impulsar la construcción de viviendas sociales?

Ellos tienen varios programas de viviendas en los que ofrecen varios diseños pero todos muy humildes, no creo incluso que sobrevivan a terremotos. Estas viviendas se conceden en forma de donaciones. Cada año hay un plan techo que consiste en donaciones de otros países sólo de láminas de zinc. Hay una nueva ley en la que se dan préstamos súper bajos, exoneración del IVA (15%). De fuera ya no hay prácticamente proyectos de construcción de viviendas. Habían muchas ayudas europeas bilaterales que ya no recibe Nicaragua. Muchas embajadas europeas han cerrado. Ocupación de tierras pertenecientes a la Alcaldía por parte de familias y permitida por la municipalidad (barrio nuevo).

Es cierto que Nicaragua está creciendo económicamente pero la mayoría del capital se queda en las grandes empresas. El hecho de que el producto interior bruto nacional esté creciendo rápidamente no quiere decir que las familias tengan más dinero.

- ¿Qué sabe de las políticas que promueven otras instituciones como CEPRODEL (Centro de promoción del desarrollo local) o el Instituto de la Vivienda Urbana y Rural (INVUR)?  
CEPRODEL ¿política de gobierno?-->  
Micro financiera. Parte del financiamiento de CEPRODEL es del hermanamiento de Maastricht. Prácticamente no dan préstamos. INVUR si es política del gobierno.

-¿Cuáles son los requisitos que se exigen a las familias que quieran solicitar esos subsidios?

Para el tema de financiamiento de viviendas se exigen familias que tengan unos ingresos familiares de entre 3000 a 6000 córdobas como salario mínimo. Es decir, unos ingresos promedios familiares de 8000 córdobas. Si la familia no tiene esos recursos, el gobierno nacional en coordinación con el grupal puede subsidiar una parte de la vivienda, no como financiamiento sino como donación.

#### **LESTER ANTONIO BERMUDEZ 18/01/2016**

¿Qué se necesita para montar un negocio en Nicaragua? (What is needed to start a business in Nicaragua?)

Depende del tipo de negocio y de la inversión que se vaya a hacer.

- ¿Le gustaría emprender su propio negocio? (Would you like to start your own business?)

Es algo que tengo en mente desde hace tiempo. El tipo de negocio que yo quiero abrir es para poder vender mi arte, mi pintura, mis cuadros. En mi caso, la inversión no es tan alta ya que podría empezar en un pequeño taller y teniendo en cuenta mi situación económica sería la mejor opción. Aún me falta el equipo completo (herramientas) pero poco a poco voy a lograr mi meta.

- ¿Sabe si el gobierno ofrece alguna subvención para eso? ¿de qué tipo? (Do you know if there is any government support for this? what kind of supports?)

No sé si el gobierno ayuda en este tipo de negocios. Sin embargo, sé que a otros

tipos de negocios sí. Por ejemplo, el gobierno ayuda a los pequeños agricultores y ganaderos regalándoles la semilla mejorada o dos o tres vaquillas para darles la oportunidad de comenzar. También hay ayudas en el sector de la construcción.

- ¿Con qué posibles barreras podría encontrarse? Which are the possible barriers you can encounter?

Quizás no poder encontrar ciertos materiales. Tengo pensado trabajar con galletas de madera y eso en El Recreo, donde yo vivo, no lo encuentro y tendría que salir fuera. En cuestión de competencia no creo que tenga problema.

- ¿Cómo fue la experiencia de trabajar con Bambú Social?

Excelente. Muy bonita porque conocí a gente nueva, me trataron muy bien y



siempre con mucho respeto. Estoy muy agradecido por lo que aprendí y por el respeto común que hubo mientras trabajé con Bambú Social.

- ¿Le gustaría volver a trabajar con bambú? ¿por qué? (Would you like to work with bamboo again? why?)  
Por supuesto, no me lo pensaría porque adquiriría más conocimiento y experiencia. Me gustó mucho trabajar con bambú.

- ¿Qué piensa de la imagen del bambú en Nicaragua? (What do you think about the image of bamboo in Nicaragua?)  
En comparación con hace un par de años, ahora es que se está trabajando más con bambú.

- ¿Y de la utilización del bambú como material de construcción? (And about using bamboo as a construction material?)  
Es muy importante la manera en que se utiliza y se trabaja el bambú, es un material muy delicado. Pero también es mucho más cómodo y económico que la madera. Personalmente a mi me gustaría hacer algún tipo de construcción con bambú.

- ¿Cuál es su opinión acerca de la casa modelo construida por Bambú Social? (What do you think about the model house built by Bambú Social?)  
Había escuchado hablar de ella en El Recreo pero nunca había tenido la oportunidad de conocerla. Me pareció muy bonita. El diseño me llamó mucho la atención. Me gustaría hacer algo parecido para mí en un futuro.

- Imagínese una empresa que ofrece paneles de bambú prefabricados, ¿cree que sería un buen negocio? ¿por qué? (Imagine a company that offers prefabricated bamboo panels, do you think it can be a good business? why?)

Posiblemente. Aquí nunca se ha visto algo parecido y el facilitarle a la gente paneles prefabricados de bambú puede ser muy atractivo. Ahorrarían tiempo y dinero.

### EMMA GRUN 19/01/2016

¿Qué son las viviendas sociales en Nicaragua? (What is the social housing in Nicaragua?)

En Nicaragua el término que usamos es "vivienda de interés social" y tiene una connotación en cuanto al costo de la vivienda en sí. Sin embargo, también tiene una connotación negativa en cuanto a diseño. Muchos arquitectos y muchas arquitectas opinamos que el diseño y construcción de viviendas, sea cual sea su tipología, debe de encaminarse hacia un diseño que sea justo al concepto de la vivienda entendida como un derecho humano universal. Esto quiere decir que es necesario alejar el término de vivienda, de la categoría de "interés social", manejada como mercancía. Trascender la producción de "viviendas sociales" como un objeto o un producto industrial terminado, para acercarnos a representar su característica de bien de uso y de producto cultural. Es decir, entenderla mas bien como acto de habitar y no como un producto económico escaso. Esto implica que también hay que repensar la planificación de nuestras



ciudades, hacia ciudades que promuevan soluciones que buscan diversidad social e igualdad de oportunidades; incremente la variedad de tipologías habitacionales dentro de los barrios; y asegure conectividad de los asentamientos a las dinámicas urbanas no sólo en materia de movilidad sino también socialmente.

¿Qué importancia tiene para usted el aprovechamiento de los recursos naturales en la construcción? (How important is for you the use of natural resources in construction?) Bueno, hoy en día manejamos que entre el agotamiento de recursos y el cambio climático radican los principales desafíos de nuestro siglo, y en líneas generales la prioridad frente a la industria de la construcción es la reducción de las emisiones de CO<sub>2</sub> mediante la reducción del consumo de energía.

Contestando específicamente la pregunta, para mí la importancia radica en el aprovechamiento razonable y balanceado de los recursos naturales renovables. Hay que buscar el balance, y esto implica que debemos transformar radicalmente nuestros métodos de diseño y construcción; tenemos que revisar de una manera muy crítica el proceso, desde la elección de materiales hasta la cantidad de desperdicios y la carencia de su reutilización. En la medida de lo posible la industria de la construcción debe de compensar los daños que genera al medio ambiente; a lo mejor transformándose en un agente que impulse la renovación y restauración de medios naturales que han sido explotados irracionalmente por muchas décadas.

¿Inculca la importancia de la arquitectura sustentable a sus alumnos? ¿Reciben los alumnos cursos relacionados en la universidad? ¿Está la UCA involucrada en algún tipo de investigación relacionada con el bambú? (Do you teach the importance of sustainable architecture to your students? Do they receive any courses related at the university? Is the UCA involved in bamboo research?)

El plan académico de la UCA es bien completo; tiene cursos que profundizan en el uso de materiales alternativos y a lo largo de la carrera los/as estudiantes reciben concientización sobre la necesidad de abordar la arquitectura de una manera holística, preocupada por todos los aspectos que la rodean. Como sabemos, todo arquitecto y toda arquitecta debe estar equipado/a con el conocimiento de

muchas ramas de estudio y variados tipos de aprendizaje, por ende, durante la carrera esta es la meta. Tengo entendido que aún no hay especializaciones, como por ejemplo un curso especializado de construcción con Bambú, pero se da la oportunidad que los/as estudiantes escojan sus intereses y profundicen en sus prácticas profesionales y sus tesis. De igual manera, vale la pena indagar sobre lo que están realizando otras carreras dentro de la UCA, aparte de la de arquitectura. Este tipo de coordinación multidisciplinar podría aportar mucho al crecimiento de la futura generación de arquitectos/as y complementar los cursos impartidos.

En los cursos que he logrado impartir sobre urbanismo he incluido el tema de la sostenibilidad en la búsqueda de respuestas o soluciones que pongan a prueba el modelo actual de desarrollo. He hecho hincapié en el carácter multisistémico del urbanismo y la necesidad que toda acción o intervención sea integral. La meta es que cada estudiante se empodere de teorías y buenas prácticas urbanas para plasmar su postura crítica sobre el modelo de desarrollo urbano actual en soluciones innovadoras que, por ejemplo, puedan mitigar riesgos ambientales y a su vez que reduzcan la extracción de combustibles fósiles.

¿Qué piensa de la relación que existe actualmente entre la UCA y Bambú Social?

¿De qué manera cree que podemos continuar con esta relación en un futuro y de manera oficial? ¿Cree que Bambú Social es una organización cualificada en la que los estudiantes puedan realizar sus prácticas o/y

tesis? (What do you think of the relationship between the UCA and Bambú Social until now? How do you think we can continue this relationship in the future and officially? Do you think that Bambú Social is a qualified organization in which students can do their internship and/or thesis?)

Me parece que es un libro que apenas se está empezando a escribir. Organizaciones como Bambú Social son activos que las universidades deben aprovechar. El hecho de conocer personas como ustedes, que están interesadas en aportar sus conocimientos técnicos en mejorar procesos de construcción sostenible, es increíble. Debemos continuar explorando la manera de aprovechar las oportunidades; entre eso está lo que mencionan: pasantías, temas de tesis, y yo agregaría talleres de diseño, foros, intercambios estudiantiles, entre muchas otras ideas. Creo que por ambas partes existe el entusiasmo, hay que aprovecharlo!

¿Qué piensa de la imagen del bambú en Nicaragua? (What do you think about the image of bamboo in Nicaragua?)

No me considero una experta en bambú, de hecho en estos últimos cinco años de mi vida profesional me he separado un poco del diseño arquitectónico para involucrarme en el urbanismo. No obstante, he notado que se están rompiendo mitos sobre el bambú. Esto ha sido algo positivo que ha aumentado la confianza en éste material como una de las soluciones más obvias para reducir nuestra explotación de materiales no renovables en la industria de la construcción. ¿Y de la utilización del bambú como material de construcción? (What do you think about

using bamboo as a construction material?)  
Así como mencioné anteriormente, creo que el bambú es uno de los muchos materiales alternativos que debemos estar explorando en nuestra región y en los que debemos depositarle más confianza. Además, con este material se ha demostrado que se puede tener resistencia estructural a la par de calidad visual y arquitectónica.

¿Cuál es su opinión acerca de la casa modelo construida por Bambú Social? (What do you think about the model house built by Bambú Social?)

La casa modelo la visité por primera vez en el marco de un curso de urbanismo que impartí en El Rama. Realmente es un espectáculo: estéticamente hermosa, estructuralmente resistente y muy minuciosa con los detalles. Fue una lástima que en esa oportunidad no hayamos podido entrar para poder apreciar la distribución espacial interna, pero igual, fue una experiencia en sí misma, y aprendimos mucho sólo de estudiar su exterior. Tengo que agregar que sobresale en un contexto donde el bambú no es un material difícil de adquirir, pero es la única casa construida casi en su totalidad con este material. Además, es interesante que es de las pocas casas contemporáneas en El Rama que recupera fielmente la construcción sobre pilotes, tal como construían antes en la zona.

¿Tiene alguna sugerencia de mejora para el diseño de la casa modelo? (Do you have any suggestions to improve the design of the model house?)

En realidad, no. Creo que fue diseñada

como una vivienda unifamiliar, pero su uso actual no cumple con ese propósito. Tal vez si la viera funcionando como tal, tendría algunas sugerencias.

¿Cuál es su opinión acerca del concepto de (vivienda) prefabricada? (Which is your opinion about prefab (housing) concept?)  
Entiendo el propósito y las ventajas. Me inclino a que además de ser modulares traigan un componente de fácil ensamblaje, por así decirlo, para que la gente pueda ser partícipe en la construcción progresiva de su vivienda, o por lo menos en la distribución de los módulos constructivos según sus necesidades o gustos. Opino que este sistema constructivo, por su pragmático proceso de diseño y construcción, podría aportar a la profundización de metodologías de producción habitacional en donde cada familia u organización demandante, pueda tener mayor control y participación de las fases del proceso de construcción de su vivienda o de su conjunto habitacional.

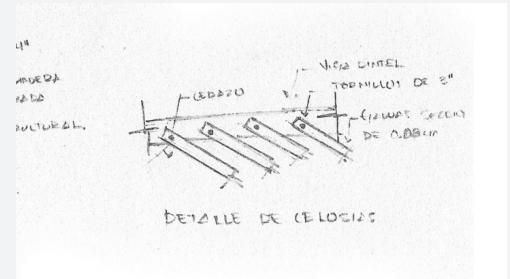
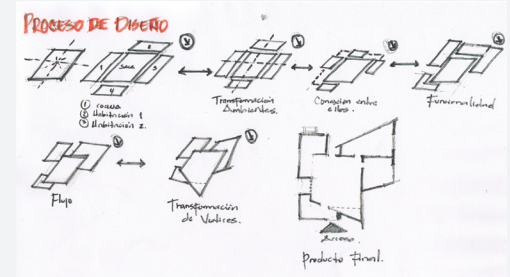
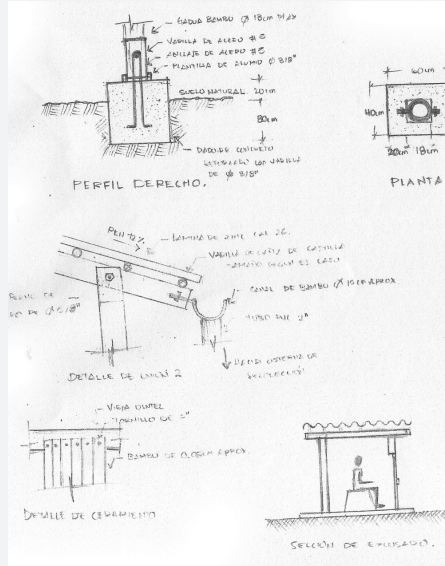
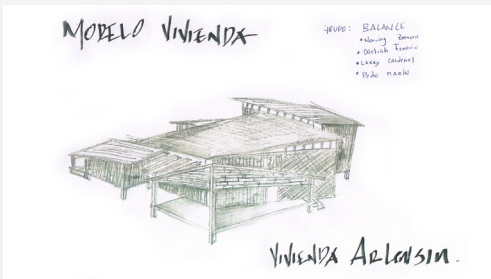
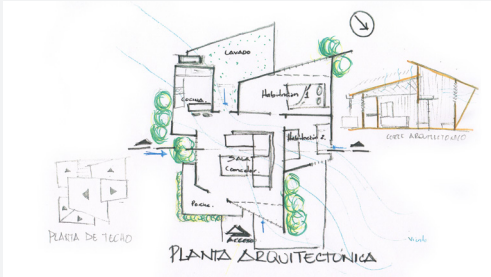
Imagínese una empresa que ofrece paneles de bambú prefabricados, ¿cree que sería un buen negocio? ¿por qué? (Imagine a company that offers prefabricated bamboo panels, do you think it can be a good business? why?)

Es una idea atractiva. Aunque hay que cuidar los costos de venta al público para mantenerla accesible a los programas de vivienda social, por ejemplo. Toda opción alternativa debe de desarrollarse pensando en lograr un uso generalizado y amplio.

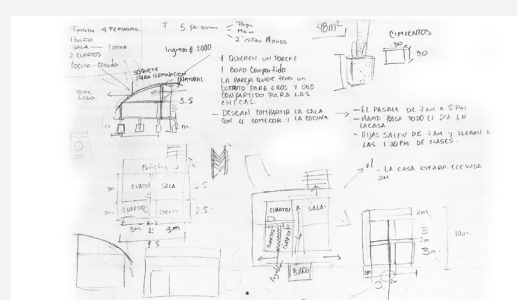
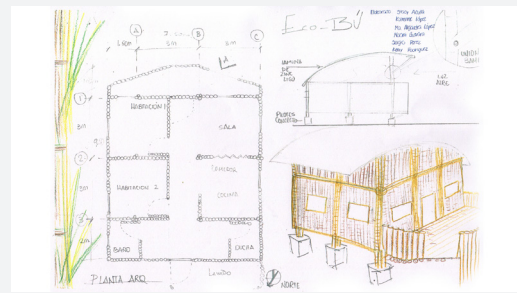
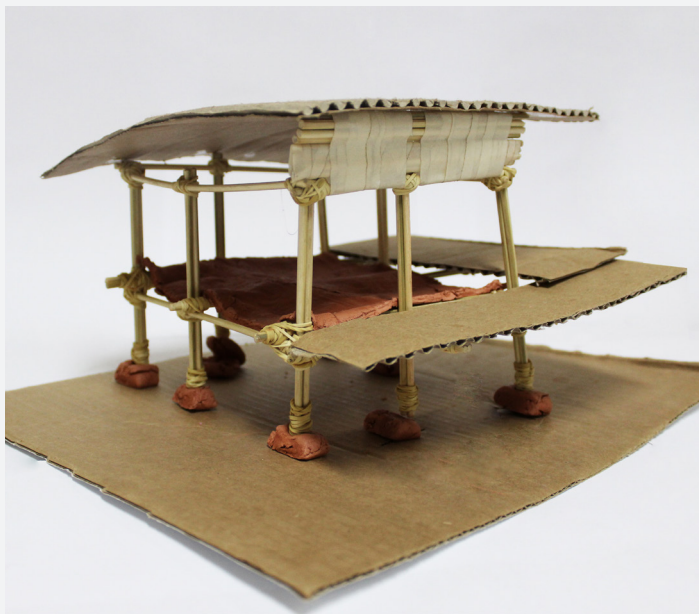




## VIVIENDA ARLASIN



## ECOBOO



## VIVIENDA DE BAMBOO

**VIVIENDA DE BAMBOO**

**I CRECEDERA MODULO BASE**

3x3=

**II Planta**

- 7 m<sup>2</sup>/pers
- Elevada del suelo
- Techos inclinados
- Amplios abros
- Recolección agua lluvia

**III AMBIENTES BASE**

- Cuartos
- Eco baño
- Uso múltiple

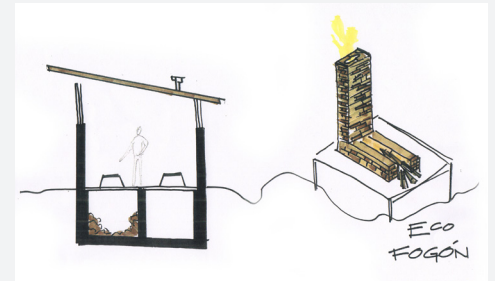
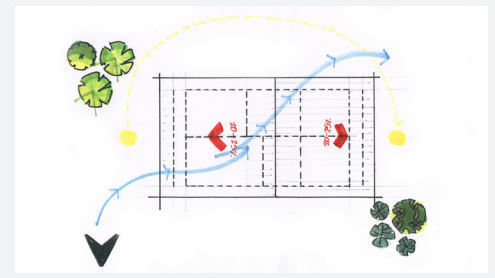
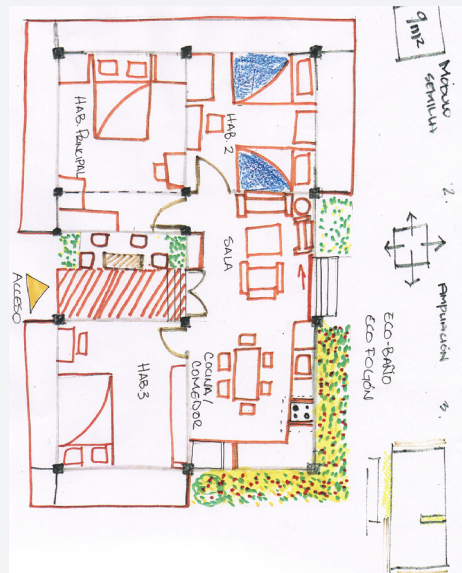
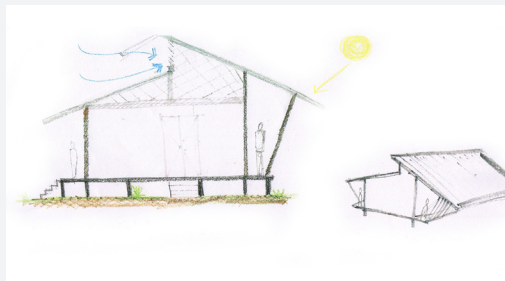
**IV UNIONES**

Sala  
Cocina  
Comedor  
Terraza

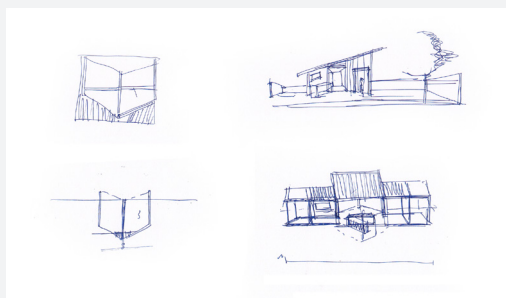
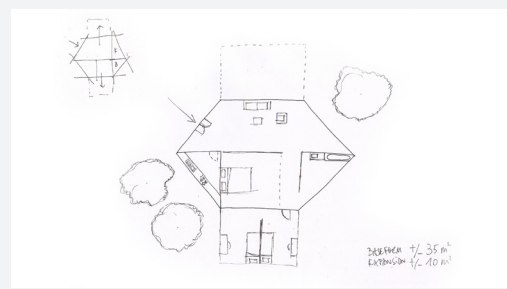
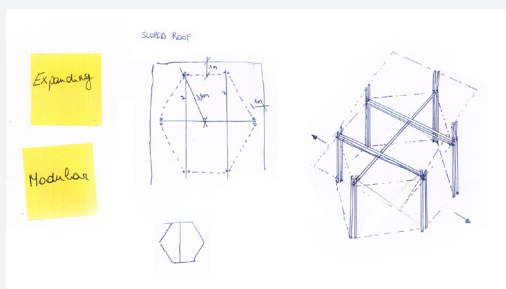
**PANELES**

→ 1.6 x 3  
→ 4 x 3

CONSTRUCION: Hilda Caballero, Juan Caballero, Esteban Pardo, Henry Lopez



## HEXAGON



# HOMEVISITS ENCUESTA

## INTRODUCCION

Somos estudiantes de arquitectura de Holanda y España y estamos realizando un estudio sobre la vivienda, con el objetivo de conocer las necesidades de los ciudadanos y de mejorar la situación respecto a la vivienda. Por ello, le agradeceríamos que nos respondiera a las siguientes preguntas. La información que nos facilite es confidencial y está sujeta al secreto estadístico.

## DATO PERSONALES

1. Nombre: \_\_\_\_\_

2. Edad: \_\_\_\_\_ años

3. Sexo:  Mujer  Hombre

## LA VIVIENDA ACTUAL

4. ¿Podría dibujarnos su actual vivienda? \_\_\_\_\_

5. Calidad y características de la vivienda actual:

- Cuántos pisos \_\_\_\_\_

- Cuántos habitaciones \_\_\_\_\_

- Acceso a electricidad  Si  No

- Patio exterior  Si  No

- Material del techo \_\_\_\_\_

- Material de paredes \_\_\_\_\_

- Material del suelo \_\_\_\_\_

- Baño  Si, interior  Si, exterior  No hay \_\_\_\_\_

- Cocina  Si, interior  Si, exterior  No hay \_\_\_\_\_

- Ventilación  Mucha  Poca  No hay \_\_\_\_\_

- Luz natural  Mucha  Poca  No hay \_\_\_\_\_

- Privacy  Mucha  Poca  No hay \_\_\_\_\_

Reaction:

6. ¿Cuál es el área/zona más importante de su vivienda actual? y por qué? \_\_\_\_\_

7. ¿Quién y en qué año construyó su vivienda? \_\_\_\_\_

8. ¿Cuántas personas viven normalmente en esta vivienda y cuáles son sus edades? \_\_\_\_\_

1			6		
2			7		
3			8		
4			9		
5			10		

9. Esta vivienda es:

- De su propiedad.  
 Alquilada.  
 Prestada.  
 Otro \_\_\_\_\_

10. ¿Cuánto paga/pagó por ella? \_\_\_\_\_

11. ¿Por cuánto tiempo le gustaría seguir viviendo en esta casa? \_\_\_\_\_

12. Situación laboral (de la persona encuestada) \_\_\_\_\_

13. Si no tiene ningún inconveniente, ¿cuáles son los ingresos familiares? \_\_\_\_\_

## LA CASA DE SUS SUEÑOS

14. ¿Podría dibujarnos la casa de sus sueños?

15. Explíquenos su dibujo:

¿Qué destacaría de la casa? \_\_\_\_\_

\_\_\_\_\_

¿Con qué materiales está construida? \_\_\_\_\_

\_\_\_\_\_

¿Qué instalaciones tiene? \_\_\_\_\_

\_\_\_\_\_

16. ¿Cuánto podría pagar por ella? \_\_\_\_\_

17. ¿Se imagina que la casa de sus sueños fuera de bambú?  Sí  No  
¿Por qué? \_\_\_\_\_

El mejor aspecto \_\_\_\_\_

El peor aspecto \_\_\_\_\_

18. ¿Conoce la casa de bambú construida por la Fundación Bambú Social?  Sí  No  
¿Le gustaría conocerla?  Sí  No

19. En términos generales, ¿cuál fue su primera impresión con la casa modelo?

- Alto
- Más bien alto
- Más bien bajo
- Bajo

20. ¿Cree que podría vivir en una casa como esta?  Sí  No

## ¡GRACIAS POR ATENDER NOS Y AYUDARNOS A CONOCER

### LAS NECESIDADES RESPECTO A LA VIVIENDA EN NICARAGUA!

Si quiere seguir colaborando con nosotros (entrevista personal) estaremos encantados de contactar con usted.

Nombre \_\_\_\_\_

Teléfono \_\_\_\_\_

Si quiere recibir información acerca de nuestro proyecto, facilítenos su correo electrónico:

E-Mail \_\_\_\_\_

Vivienda actual

Vivienda de sus sueños

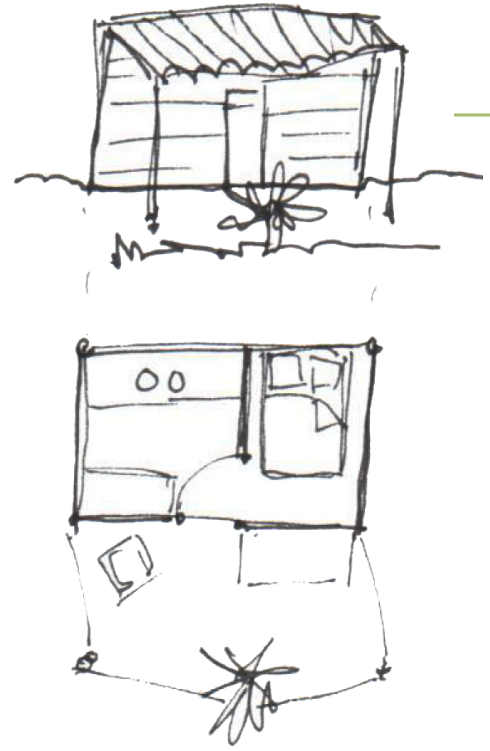
# HOMEVISIT STORIES

## FINANCIAL AID

Inginia Holec Calderón was sitting in front of her house, and at first she wasn't sure if she wanted to contribute to our research. Soon turned out that she has minimum eyesight due to untreated diabetes, so she had to ask her husband to draw for us. While he was looking for a ruler, she started talking.

Just like María Vargas, Inginia and her husband live on this piece of land for years without official documents, but until now, no one came to claim their land.

When her husband found his ruler he starts drawing fanatically. Due to an accident many years ago, his left arm was amputated from the wrist down. Because of their disabilities, the couple receives governmental assistance



for living expenses. The aid exists of an amount of rice, beans and oil. Just enough to live. They have no access to water or electricity and they use the bathroom of their neighbours. The wood and zinc covered walls are in bad condition and even though they live in the city center, between

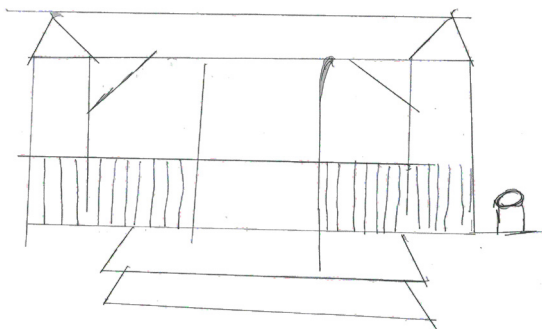
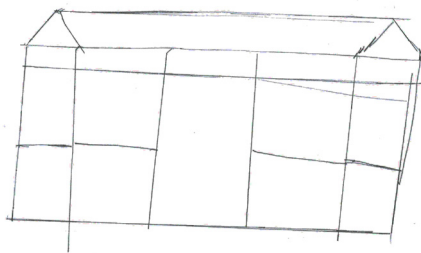




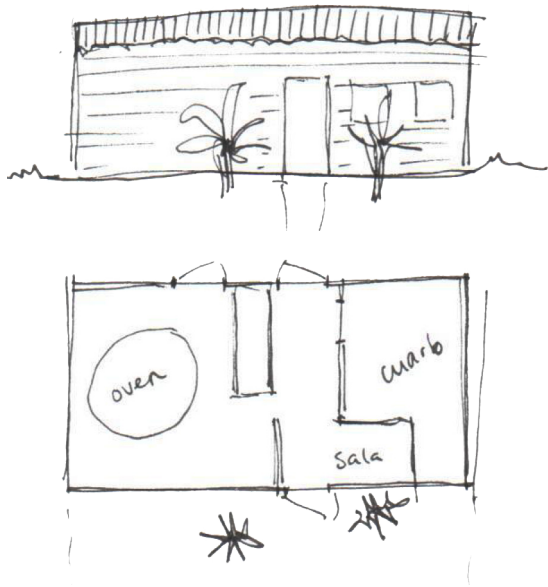
shops and concrete buildings, they live on a dirt floor. "Definitely", she said, they would love to move to a more decent house.

Her dreamhouse is elevated so it is positioned slightly higher than the street, and a few steps are needed to get to the entrance. It has two floors and it is made out of concrete and wood. Although, she said, cheap wood doesn't last long in the climate of Nicaragua, while pointing out a few rotten pieces of wood in her current house. To replace the wood with well treated bamboo would be fantastic.

While finishing the interview it gets dark, but that doesn't keep her from explaining us how they stay healthy, despite their limited diet. The root of a plant in front of their house is the secret. You can make soup out of it, or tea for example. If she had more space, she would love to invite us to taste it one day.



The current situation and the dreamhouse, drawn by Inginia.



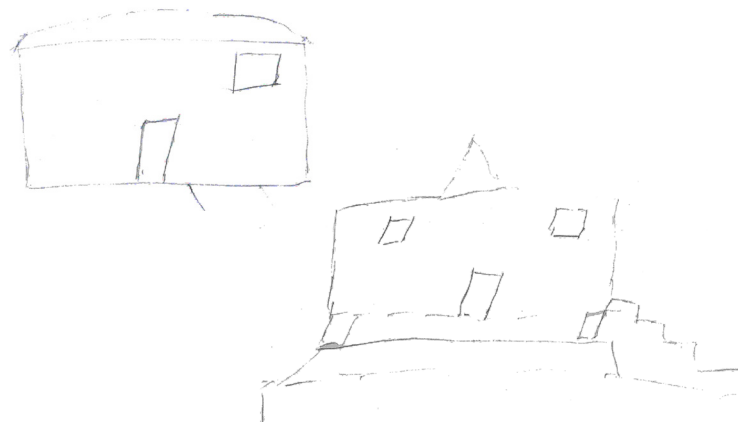
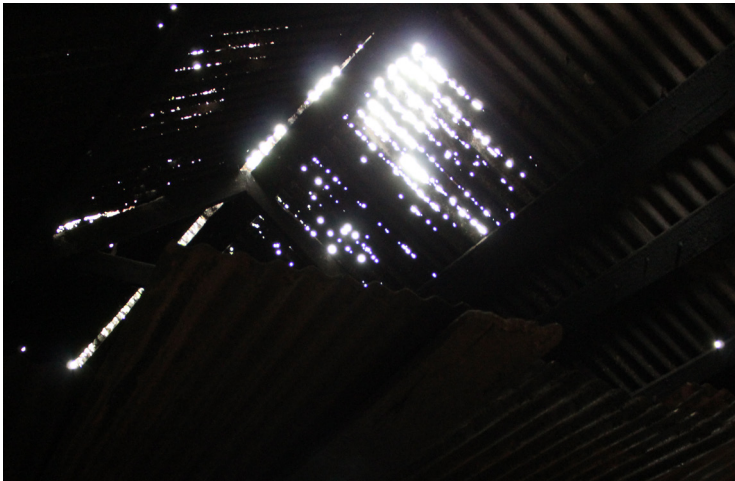
### MARÍA'S BAKERY

The main part of María Vargas' living room is filled with a huge oven. María is a hardworking woman and makes the best bread in El Rama. She lives with her daughter, her three grandchildren and an adopted special-needs young man, Don Alfi. "Someone came to me and asked if I wanted to take care of him, so I did, and I still do. Because, honestly, who else is going to do it? The rich people won't, I am sure about that..." explains María, with tears in her eyes.

All six family members sleep in the same bedroom. The zinc roof is perforated by rust and needs replacement, but the bakery is still in tact. Yet, María is fighting for its existence, since the house is in dispute. When she was thirteen years old, her family expropriated the plot without official documents. After the big hurricane of 1987 they rebuilt the house, and it has been used intensively all this time. But now, the land is claimed back and a big 'for sale' sign marks the entrance of the plot.

However, she isn't looking for a new place to live. "I don't have any other option. The revenue of the bread is my only income, and after all these years here, they can not just send me away". However, she does dream of a house like the big american ones on tv, she tells us while drawing. "You are architects right? Can you design it for me?"





The current situation and the dreamhouse, drawn by María.





### ONE MAN'S LIVING

While welcoming us on his little veranda, Ramón Isidro Ocón tells us proudly that he built the house all by himself and he has the best view of El Rama.

His home is small, simple but comfortable and is surrounded by lots of banana trees. Indeed, he has the most wonderful view on the joining Río Escondido and Río Rama, and nature surrounding him. Also, the breeze that goes through the elevated house, gives it a nice and comfortable indoor climate. For a moment, we forgot that we were

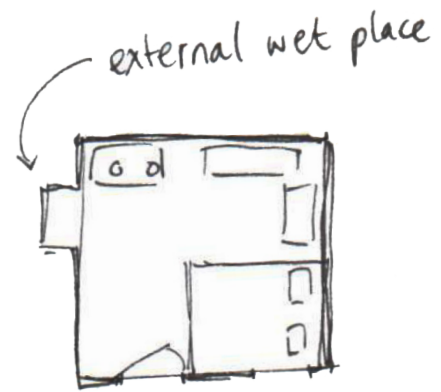
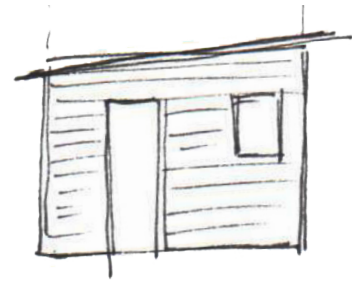
surrounded by the chaotic traffic of El Rama, and we drifted away by the view.

Ramón is a retired, 76 year old man. He lives alone and only needs the minimum: a little sleeping room, small stove, a porch and a chair in every lookout of his house. While showing us around, the love for his house twinkles in his face. He doesn't want to draw his dreamhouse, he says, because he never learned how to draw. Nevertheless, he explains that he doesn't really need more than he has, but his house definitely needs to be repaired in some places. He recently bought two planks to fix the broken ones in his porch. He needs to improve a lot more, he mentions, but his pension just covers the costs of food and electricity so at the moment he doesn't have the money to do it.

Ramón was really enthusiastic with our visit and wanted to know all about Bambú Social. His most important advice was to listen carefully to the people of El Rama, since after all, they are going to be our customers.



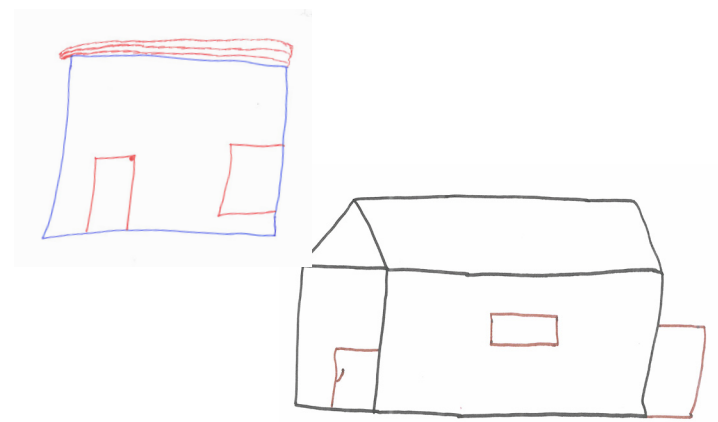




## MOVING OUT

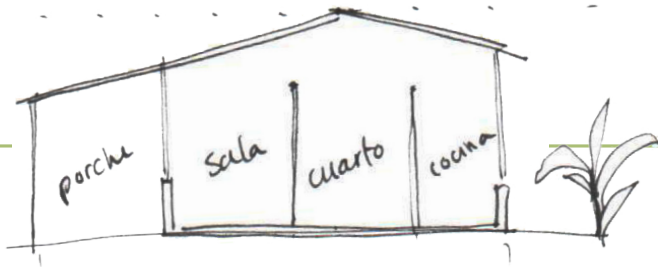
When we walked by, Jusnielca del Carmen was sitting in her doorway, watching her one year old daughter while chatting with her mom. When she got pregnant at 18 years old, she and her boyfriend decided they wanted to move out and raise their child together. However, with their income they couldn't afford to buy a plot and build their own house. Finally, they used second hand materials to build their own place at the plot of her parents. In this way, they save costs on the land. Also, they don't have to dig their own well or build their own bathroom and on top of that, once in a while, they can take advantage of the presence of her mom to watch the baby.

Their house is small and exists of only one room with a simple stove and wet place in the corner. Nevertheless, they have the privacy and independancy they hoped for. "I do not have work, and my boyfriend is a construction worker. I'm really glad we found a cheap and comfortable way to live and raise our child together."



The current situation and the dreamhouse, drawn by Jusnielca and her sister.





### THREE SISTERS

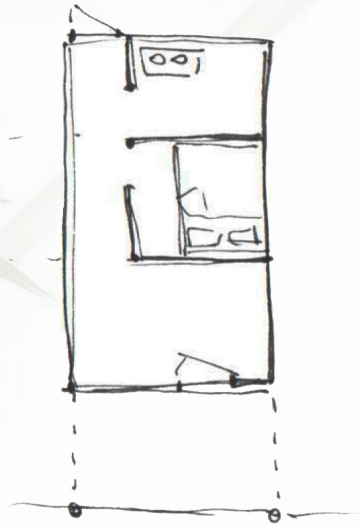
Yanina Morales lives with her husband and her daughter in a simple, three persons living with all that comforts them. They have a concrete floor, as a part of the minifalda construction, and the wood of the walls looks new and fresh. "The house was built recently" she explains, "It still needs to be painted.

She works as a teacher and together with her husband they earn 10000 córdobas (345\$) monthly. They have enough money to cover their basic needs and have little savings capacity. Together with her two sisters they bought a plot, on which they all built their own house. "Because we share the bathroom and washplace in the patio, we had more financial possibilities to build a nice and spacious house."

They chose to share the bathroom and washplace, but they all wanted their own kitchen. "It gives each of us more

independence. We can cook what we want without getting in each others way and we can keep track of our own expenses."

She doesn't want to draw the house of her dreams, because it is exactly the house she lives in now. "Ofcourse it could also be made out of bamboo. Like the model house of Bambú Social. It looks really fresh, but I prefer a concrete floor."









### ONE BIG FAMILY

At the south side of the river, the notorious Miranda family is well-known. The head of the family, Esther Miranda, had no less than nineteen children. Since they all started their own families and built their houses in the neighbourhood, Esther can proudly say she herself populated the whole area 'up the hill'.

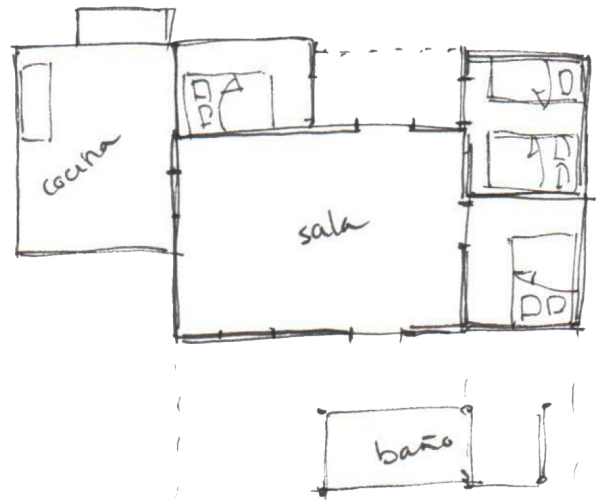
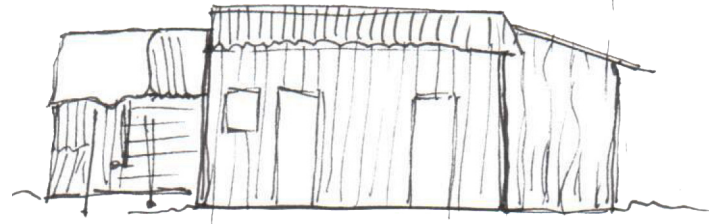
The part of El Rama on the south side of the river exists of one long, dirt street. Going slightly upwards from the place where hollowed trees transport people, provisions and cattle across the river. Esther's husband works in one of those boats, while

she controls the household. To provide all children with food, she explains, they added a separate kitchen a long time ago. It is constructed out of bamboo and zinc, and over time, all kinds of materials were added to strengthen the construction. The main reason to extend the kitchen from the house was for the smoke, since she cooks on a wood fire, but also because the space inside the house was needed to sleep in. Over the years, they added four little bamboo bedrooms to the back and the side of the house. But still there is only room for 7 persons. Especially in former times, many family members had to sleep in hammocks in the living room.

Like all other households at the south side of the river, the World Bank built a toilet for them as a part of their water project (p. 22).



THE BACK SIDE OF THE HOUSE



# BUSINESS MODEL BAMBÚBUENO

## INTRODUCTION

Bambú Social is an educational and construction project with the main goal to share knowledge and expertise about the use of local resources for sustainable and affordable social housing. Building techniques used in subtropical areas are often not adapted to the local environment any more. The construction materials used in El Rama (Nicaragua) create a warm and humid interior climate and are produced with processes that pollute the natural environment. In addition, the local population is dependent on unreliable systems for electricity and clean drinking water. In El Rama, Bambú Social has set up a 'Sustainable Construction' course, together with the local university and the municipality,

to create a sustainable alternative for social housing. The building that they designed can be built with local techniques and it contains an integrated low-tech, natural water purification and storage system that provides clean drinking water for the inhabitants of the house. In 2014 a model house was constructed that forms the base for the design of an affordable social home and the manual 'Un manual de construcción sostenible', which explains the entire process with step by step drawings. The model house has been donated to the local university and currently functions as a library.

This year we continued the Bambú Social project and traveled to El Rama. Our assignment was to evaluate and analyse



the work done by the previous group and evaluate the impact that the project had. We wrote a constructional report on the current state of the model house containing several improvement suggestions that can be used in the future for a design for a social house.



We wrote an second report on the social situation in El Rama. In this report we analysed the current living situation and housing conditions of El Rama by visiting people at their homes. The third report is about the impact of the project on El Rama and its inhabitants. From the improvement suggestions we made in the constructional report we select a couple improvements which we tested during the construction of a small roof construction made out of bamboo.

As explained earlier, Bambú Social is working on a manual for an affordable social house. This social house is still being upgraded and in the future it will be build up from prefab elements. The manual will explain step by step how to connect the prefab elements and how to build the social house. The distribution of the manual enables everybody in Nicaragua to build their own social house.

This business plan is written for a prefab, bamboo elements producer that produces the collection of bamboo elements, needed for the construction of the social house. This prefab company, named BambúBueno, is a crucial factor for achieving the mission of Bambú Social, to improve the housing conditions in Nicaragua by creating a sustainable, affordable and comfortable house. This company is needed for the up scaling and the upgrading of Bambú Social.

Since this business plan originates from a developing project, it is a given that BambúBueno should meet the definition of a sustainable/social enterprise, in a social as well as in an ecological way. But how can sustainable entrepreneurship be defined, and how does it differ from development aid or the old colonial relationships that the West had with developing countries. The book *Entrepreneurship, Innovation and Sustainability* gives the following definition of sustainable entrepreneurship: "The colonial relationship focused on financial goals, the development aid relationship focused on social and/or ecological goals. Sustainable entrepreneurship tries to combine the strengths of both the 8 colonial and the development aid relationship,



aiming to balance financial, social and ecological goals, therewith creating a viable alternative for both" (Wagner, 2012). This definition gives a global idea of the mission of a sustainable enterprise, what can help during the formation of the business plan. Besides the definition of sustainable entrepreneurship, it is important to know what makes a sustainable or social entrepreneur. Gregory Dees explains the social entrepreneur as follows: "Social entrepreneurs play the role of change agents in the social sector, by adopting a mission to create and sustain social value (not just private value), recognizing and relentlessly pursuing new opportunities to serve that mission, engaging in a process of continuous innovation, adaptation, and learning" (Dees, 1998). These two quotes tell us that the development aid aspect of BambúBueno should be a very important factor within the company, even if it is at the cost of financial profit.

Gregory Dees also explains that a social/sustainable entrepreneurial approach to social and developing problems can be a highly effective solution because it combines development aid with the possibility of financial profit. This idea is confirmed by Christian Seelosa who states that "social entrepreneurship is a structure that allows individuals to strike their own balance between the desire to make a social contribution and the personal need to capture an economic return from professional activity, across a wide range of possible ratios" (Seelos, 2004).

This entrepreneurial approach towards development problems is very interesting for BambúBueno but also for Bambú Social in general, because it gives the foundation a good idea of how they can implement their good intentions in a feasible way.

Another supporter of this entrepreneurial approach is William Easterly who states in his book "The white man's burden" (Easterly, 2006) that the last decades have shown that the governmental and philanthropic aid programs are less effective as expected. It has been revealed that the major social sector institutions are often inefficient, unresponsive and ineffective. Instead he promotes a bottom-up approach that tries to offer a solution through entrepreneurship. By keeping this bottom-up approach in mind, we hope that BambúBueno can have an impact on the housing problems in Nicaragua.

## THE BUSINESS MODEL CANVAS

This Business model canvas is based on The Startup Owners Manual (Blank, 2004) by Steve Blank. This manual explains the theory behind the canvas and gives examples of how it can be filled in. The Business model canvas can be found in the attachments. In PART 3 the different blocks of the canvas are explained.

## KEY PARTNERSHIPS

Bamboo farmers  
Bamboo treaters  
Transport company  
Construction company  
University of Managua  
Micro Finance agency

## KEY ACTIVITIES

Production  
Construction  
Maintenance

## VALUE PROPOSITIONS

Prefab elements  
Construction service  
Maintenance service

## CUSTOMER RELATIONS

Personal assistance  
Professional assistance  
(bamboo community)

## CUSTOMER SEGMENTS

Individuals  
who want to build/buy a  
sustainable house

Government/  
foundations  
who want to set up a  
social housing project

Professionals  
architects or contractors

## KEY RESOURCES

Treated bamboo  
Workshop  
Equipment  
Finance  
Transportation  
Employees  
Marketeers

## CHANNELS

Construction manual  
Word to mouth  
marketing  
Newspaper articles  
Handcraft courses

## COST STRUCTURE (FINANCIAL)

Material costs  
Transportation costs

Workers (labour costs)  
Marketing costs

Production costs  
Fixed costs (rest, water)

## REVENUE STREAM (FINANCIAL)

Product sales  
Construction service

Repair service  
(maintenance)

## SOCIAL COSTS

Jealousy of competitors

## ECOLOGICAL COSTS

Treatment chemicals  
CO<sub>2</sub> emission (transport)

## SOCIAL REVENUES

Employment, education,  
awareness, safety, health

## ECOLOGICAL REVENUES

Less deforestation, less soil  
erosion, less use of harmful  
materials, more CO<sub>2</sub> absorption

## BUSINESS MODEL BLOCKS

We will elaborate on each of the nine blocks.

### 1. CUSTOMER SEGMENTS

#### Individuals

In Nicaragua there's a serious need for comfortable and safe homes. Over the past decades, Nicaragua has been hit by devastating political, economic and environmental events. This has left the nation in a precarious development position for this century. 78% of the people in Nicaragua lives in substandard homes or do not have adequate housing. Based on our research we can divide this 78% in three segments, depending on their financial situation.

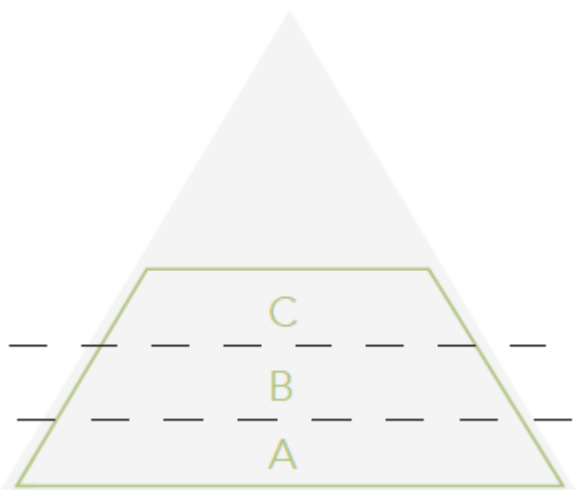
Segment A consists of those who have difficulties to cover their basic needs, those who are able to cover them (segment B) and those who have saving capacity (segment C). Together the subgroups can be seen as one huge 'bottom of the pyramid', in which segment C is on its way to climb the social ladder to the middle class. With an average income of 11000 córdobas, the people of

For segment A, with an average income of 2500 córdobas monthly, the same applies. The different possibilities are discussed in more detail on page 30 (Social Housing Analysis). After all, these options are essential for reaching all segments of the target group.

Bambú Social wants to serve the people in need of a decent house by offering them an affordable alternative for their current house. This social mission is the main incentive for Bambú Social to start BambúBueno.



An often heard criticism is that the proposed customer segment of BambúBueno is too poor which makes the business not feasible. It is true that the income of the proposed customer segment is poor in comparison to Western people but this does not make it impossible to create products for this group. In fact, the target group of BambúBueno fits in a huge group of customers for who almost no product are produced. This phenomena is very well described the book *The Fortune at the Bottom of the Pyramid* (Hart, 2002). This book explains that almost all the wealth of the world is owned by a small elite group on which almost all product





producers are focused. However, there also is a group of 4 billion people who make less than \$1,500 a year, which gets very often ignored by these product producers. So when you come up with an affordable product that fulfils the needs of this 'poorer' customer group, you reach a huge market with lots of possibilities. This is exactly the plan we have for BambúBueno, and with the help of microfinance companies like Kivia, BambúBueno can even reach a bigger group of people.



Furthermore, Bambú Social has designed a new social house in collaboration with architecture students from the UCA. The design for this social house is adaptable to many different living situations. The design consists of six phases, in which every higher phase is an upgrade of the previous one. The first phase of the design is really simple and affordable for even the poorest families. The sixth phase is bigger and more luxurious upgraded version that fulfils the demands

of the richer families. With this new design BambúBueno can reach the whole target group.

### Professionals

This segment consists of professional contractors and architects who are convinced that social housing can be cheaper and more sustainable by using bamboo as main construction material. They have a lot of knowledge about constructing, also on a bigger scale. They are hired by bigger housing companies (or the government) who do big investments and provide the people from entire villages of social homes.

During our stay in Nicaragua we visited some governmental projects with the aim to provide social houses for low-income families. An example of such a project can be found in Rama Key. This village is famous for its indigenous houses that are well adapted to the climate. However, the government started a huge housing project in the center of this village. The houses build by the government are constructed with cheap materials and the design is not adapted to the climate. Even though the houses are really bad, the project itself is very hopeful. The project in Rama Key and other housing project along the east coast show that the government is very interested in large scale housing project.



## 2. VALUE PROPOSITION

To be able to tackle this housing problem in Nicaragua, BambúBueno has to look for work-around, improvise solution and find ways to incorporate those into the offerings it creates. This process can be described as design thinking which involves: "Designers who consider what we call the edges, the places where extreme people live differently, think differently and consume differently". (Brown, 2010) Design thinking can be the first step to social innovation and by approaching the housing problem in Nicaragua from a designer's point of view; BambúBueno can make a major progress. So, in order to make a difference BambúBueno has to come up with a value propositions that meets the needs of the costumers, while taking into account the cultural, social and infrastructural context.

To serve the two costumer groups of Nicaragua, the company has three products which form the three value propositions of the business model.

1. Prefab bamboo elements: Customers can buy these prefab elements and build their own house according to the manual. Calculations of Bambú Social show that the prices of these elements are around the \$3000. This product is meant both for the families as for the professional contractors and architects:

- Individuals: They can buy bamboo elements and a construction manual, with which they can build their own house. The need of housing is then solved on individual level. Microfinance or paying in terms could



make this product more accessible.

- Professionals: They can buy the construction elements and build the (social) houses for their clients, in order to provide the housing need in Nicaragua. Cooperation between these professionals and the bamboo prefab company is important to scale the project of Bambú Social up. Yet the professionals are the customers because of their need of prefab construction elements.

2. Maintenance of the social house: this service is mostly meant for the individuals who have built their house themselves.

These customers aren't professional and it is likely for errors to occur after the house has been built. The prefab company could be hired by this customer group to do maintenance of the house built.

3. Building service: the individual customer group can also choose to let their house be constructed. If they do not their construction knowledge the prefab bamboo company provides them with the building service. The



professional building service usually doesn't provide individual constructions, therefore this building service of the prefab bamboo company is meant for the individual families.

### 3. CHANNELS

Because bamboo is a new construction material, the company has the task to raise awareness among the people of El Rama about the benefits of constructing with bamboo. *BambúBueno* needs several channels in order to reach the customers. The professional customers require a different channel than the individual customers.

#### Individuals

- Create awareness through different channels like a professional website, articles about the products in magazines and newspapers and mouth to mouth publicity.
- Give the customers the chance to evaluate the products by listing finished project and product on the website or post reviews in local magazines. It is also possible to invite possible customers over to a model of the house or the workshop so they can inspect the product.
- A professional service and sales department that can answer any questions



customers might have.

- An after sales department that keeps in touch with finished projects. By combining this department with a maintenance service, *BambúBueno* can maintain a positive relation with the costumers with is beneficial for the images and publicity of the company.

#### Professionals

- Reports and articles in journals and professional trade magazines.
- Workshop and activities with local contractors about the social house.
- Distribution of the construction manual to architects and contractors.
- Cooperation agreements with special prices for professionals

### 4. CUSTOMER RELATIONSHIP

Both customer segments require a personal and long-term relationship with *BambúBueno*.

Personal assistance: For the individuals because they should always have the possibility to *BambúBueno* when they have questions or problems with their house. This means that *BambúBueno* must always be ready to visit the customer or help him with his problems. This is also part of the maintenance service that the business provides.

With the professionals it is important to maintain a personal and long-term relationship because they are big current and future customers. Furthermore, the professionals have a lot of influence on the image and publicity of *BambúBueno*,

therefore it is important to maintain a personal and positive relationship. When an architect comes up with a new model, the company has to adapt or create more prefab elements. When more companies are involved and when this construction method is implemented in multiple municipalities, a bamboo community will arise where topics about bamboo as a construction material are discussed. In this community the key partners are also involved.

## 5. REVENUE STREAMS

### Financial revenues

The prefab bamboo company will mainly gain there revenues with the sale of the bamboo construction elements. The price is established by the variable costs and the fixed costs and the relevance of the piece. The costs of the resources should at least be covered. Therefore is it beneficial for the company to make as many as the same elements as possible.

Beside the standard prefab elements that the company will produce, they will also produce custom elements meant for the designs of the architects and contractors. The bigger the order, the cheaper each element gets. This stimulates the contractors to construct as many as possible at once.



For the families there's also the revenue as a result of the maintenance service and the building service. This of course depends on how many working hours are needed.

### Social revenues and ecological revenues

While writing this business plan, we have taken in to account the idea of shared value, as explained by Porter and Kramer. According to them, shared value is a solution for the recent increase of social, environmental and economic problems that business cause for their environment. In their paper, creating shared value, they suggest to address this problem as follows: "The solution lies in the principle of shared value, which involves creating economic value in a way that also creates value for society by addressing its needs and challenges. Businesses must reconnect company success with social progress." (Porter, 2011) This quote is a perfect explanation for the goals of Bambú Bueno, this business plan leads to the following social and ecological revenues which can have a major impact of social and ecological progress.

The most important social revenue for Bambú Social, is to create awareness among the local people about the benefits of



constructing with bamboo. A new culture is created and the most materials that pollute the most are less and less used. The company creates more employment for the people of El Rama. Not only will the people gain more salary, they will also be educated. They will learn about construction mechanics, safety and sustainability (taking care of the environment). Because a high safety level is maintained, health among the employees can be assured. Educating them about the environment should also teach them how to handle waste how to reuse materials, and they will pass it on to their families.

As mentioned above, by using bamboo as main construction material, awareness about

the environment is created. This belongs to the ecological revenues. Because bamboo is used the CO<sub>2</sub> emission will go down, the absorption of CO<sub>2</sub> will go up, deforestation will go down, soil erosion will go down, the use of harmful materials goes down, and less pollution is created. Using bamboo the environment is being less and less harmed. It is indeed a sustainable construction material.

## 6. KEY RESOURCES

In order to conduct these key activities, BambúBueno needs several key resources. The following list sums up these required resources.

1. Treated Bamboo: This is the main construction materials and it is needed

### MADE OF BAMBOO

The bamboo plant grows very quickly and while growing it requires little upkeep. Besides bamboo is a product that is easy to work with and in comparison to other construction materials it is relatively cheap. Furthermore, bamboo is available throughout the whole country and people can grow it locally what makes it even cheaper.

#### Quick and easy to build

The bamboo elements are prefabricated in a workshop in a controlled environment. This makes the quality of the elements higher and steadier. The elements are designed in such a way that they are easy to connect to one another, this makes the construction of a building easy and quick.

#### Customizable

The prefab elements are easy to connect and disconnect. This makes the house adaptable to the changing living requirements of the owner. If an owner wants to change the size of his/her house it is easy to add or remove parts.

#### Sustainable

Bamboo is a sustainable building material that grows fast and requires little nutrients and because it is produced locally it requires little transportation. Furthermore, it helps prevent soil erosion and deforestation of the rainforest and it has a high CO<sub>2</sub> intake.



to produce the prefab elements and to maintain the social houses already build.

2. Workshop: *BambúBueno* needs a place where they can produce the elements.

3. Equipment: Tools and other equipment are needed for the production of the elements.

4. Finance: In order to start the business there needs to be a start capital with which the business can make the needed investments.

5. Transportation: *BambúBueno* needs a truck to transport the elements to the costumer or to visit the costumer for the maintenance of the house.

6. Employees: *BambúBueno* needs several skilled employees who are experts in producing these elements. These employees should also be able to do maintenance work at the costumers place. They first have to get educated, and will later on be able to educate other.

7. Marketers: *BambúBueno* needs a marketing strategy. This can help them with the promotion on their product and reach out to potential customers. This tasks also includes keeping the bamboo community running.

## 7. KEY ACTIVITIES

The main activity of the proposed business is the production of prefab bamboo elements. With these elements a social house can be built, with help of the construction manual. Customers can buy these prefab elements from *BambúBueno* and build their own house with use of the manual, which comes with the elements.

However, customers can also ask *BambúBueno* to build the house for them;



this leads us to the second key activity constructing the social house.

The third key activity is a maintenance service which owners of the social house can call if there are some reparations needed.

## 8. KEY PARTNERSHIPS

The key partners provide *BambúBueno* from the key resources needed for the key activities. The following list shows these key partners and their value.

1. Bamboo farmers and treaters: The bamboo farmers produce and cut the bamboo. After the harvesting the bamboo is treated with a solution that gives the bamboo more durability and resistance against the weather. This treatment can



be done by the farmers or there could be another party involved that takes care of the treatment. After the treatment the bamboo needs to dry for several months. The drying process gives the bamboo stems more strength and durability. The eventual products are treated and dried bamboo stems, ready for production. During our stay in Nicaragua we visited two bamboo farms, El Recreo and EcoPlanet Bamboo. EcoPlanet Bamboo an international company that owns thousands of acres of bamboo (*Guadua Amplexifolia*) in and around El Rama. This bamboo is great for construction. However, during a meeting with EcoPlanet we noticed that they are more interested in producing products like charcoal and napkins since the profit margin of raw materials too low. Also El Recreo was not very positive about the idea of selling bamboo on a large scale. We believe that it is important for *BambúBueno* to emphasize on the social aspect of the company since it is not financially interesting for the big bamboo farmers.

2. University of Managua: The University of Managua is an important partner for the company. The student can do research on bamboo as a building material and on the production process of bamboo. This research helps to improve the production process of the company as well as the quality

of the product. Furthermore, by involving young students the company can secure the continuation by delivering new designs. They could teach apprentices or student the trades of the company after which they can work for the business or start their own. Both ways support the use of bamboo. As mentioned before (with the contractors) after a while a community will be created. This community will be the bamboo platform in Nicaragua (and maybe further on). For students this forms a source from which material characteristics and designs are spread. During our stay in Nicaragua visited the UCA for a workshop that we organised for the architecture students. After this workshop a group of five students applied to join our project. With the help of these students designed an alternative version for a social house. The involvement of the UCA students was very positive and we believe that for *BambúBueno* it is very interesting to involve the UCA. The students are very interested in social projects, they see it as a possibility to acquire work experience and at the same time contribute to the development of their country.



3. Transport Company: The transport company has to make sure that the bamboo is transported from the farmers to the company in time and safe. By hiring a third party to take care of the transportation, *BambúBueno* and the bamboo farmers can focus on their main activities. For *BambúBueno* it is a good choice to outsource the transportation so they do not have to worry about to main side activities. We experienced that transportation is a big business in El Rama and the rest of Nicaragua because major part of the population cannot afford to own their own transportation. There are a lot of private transportation services that transport any material with bicycle, truck or car.

4. Microfinance Company: A big part of the population of Nicaragua lives on a minimum wage or less, for these people it is hard to pay for the house. Microfinance could offer these people a solution by enabling them to pay in installments. It is not a good idea for *BambúBueno* to offer the microfinance themselves, but instead they should partner with a micro financier like Kiva. By involving a partner who is specialized in microfinance, the business does not have to deal with defaulters and other risks but instead it can focus on their prime activities. A microfinance organization is a very important partner because it increases the sales market drastically.

## 9. COST STRUCTURES

When starting the company, some investments have to be made. But the company will also have to pay in social and ecological sense.

### Financial costs

When starting *BambúBueno*, the most substantial costs are the workshop and the machinery. These are two big investments and the business will need a start capital to finance them. It is also possible to implement this business model in an existing workshop, in which case the investment costs are reduced.

While running *BambúBueno* there are several costs that need to be taken into account:

- Fixed production costs: wages, upkeep machinery
- Variable production costs: means of production, electricity, water, petrol, transport
- Raw materials: treated bamboo
- Rent: Bank loans
- Marketing costs: articles in magazines or journals, discount for professionals, promotion, community costs
- Investments: quality and efficiency improvement





### Ecological costs

These costs can be described as the negative impact that *BambúBueno* has on the environment and the ecosystem. The cause of these costs is, unfortunately, the production and transport of bamboo elements, but also the impact of the raw materials on the environment is taken into account. The following lists sums up all the ecological costs that result from the production of the elements, with a distinction between direct and in-direct costs.

1. CO<sub>2</sub> emission by transport and production of elements.
2. The usage of bamboo, including the chemical treatment.
3. Ecological production costs like, electricity, water, heat.

As the list shows, there are quite a lot of ecological cost that result from the production and construction of a social house. However, when comparing these ecological costs to the ecological costs produced by the construction of the most common house in Nicaragua (concrete blocks with aluminum roof sheets), we see that the costs are significantly reduced. Therefore we can say that even though there are some ecological costs, the bamboo social house is environmental friendlier as most of the current houses in Nicaragua and on ecological costs a big improvement.

### Social costs

It is possible that the company creates some social costs because it is a new player

in the housing market, which can result in some competition. This competition is of course a positive result because it forces the company and its competitors to keep improving. However, this competition could turn into jealousy when the company takes more and more customers from the competitors. This jealousy could increase when *BambúBueno* promotes their products as better and eco friendlier and could result in negative publicity for the competitors. It is recommended that the business involves local competitors instead of squeezing them out of the market. In this way, *BambúBueno* and the whole idea of building with bamboo can spread around the country and grow rapidly.

### THE CONCLUSION

By working out this business plan we have developed a better understanding of social entrepreneurship in general but also a better understanding of the specific situation in Nicaragua. We have learned that starting up a business requires a lot of planning and research but at the same time a lot of flexibility. The lean start-up theory has thought us that it is important to be able to pivot your business plan around in order to succeed. This could be difficult for a social entrepreneur because this means that you must be able to alter your mission and maybe not follow your passion, but it is important for the success and therefore also the impact of the project.

While we were in Nicaragua we evaluated this business plan and checked if it is realistic. We investigated if the partners

that are needed for BambúBueno are interested and if the quality of the needed infrastructure is sufficient. Furthermore, we checked if there are people interested in starting BambúBueno. Also practical aspects were investigated, like the local salaries, the costs of the workshop, etc. All these findings are documented in the social and impact analysis. We will give a small summary of our findings.

We experienced that the infrastructure in El Rama is sufficient to start BambúBueno. Transportation is not a problem because there are lots of private transportation services. Furthermore, there is a reliable electricity network present and in the city there are plenty of buildings where such a small workshop can start. The only problem we see is the lack of a functioning water system that is needed for the treatment of the bamboo. This can be resolved by using rainwater or using water from the rivers.

We investigated if the partners that we described in the plan are interested in working together with a company like BambúBueno. The UCA in Managua is very interested because the students see working for a social enterprise as a great way to gain working experience. Also the transportation services are very interested. There is always a truck for rent as we experienced during the construction of a small bamboo roof. The only obstacle for BambúBueno is the constant supply of bamboo, also on a large scale. During our stay we were able to buy our bamboo at a small farm near El Rama, but these farms do not have the capacity

to provide the large amount of bamboo that is needed for BambúBueno. The larger bamboo plantations that we visited (El Recreo, EcoPlanet Bamboo) were not very optimistic about working together with a company like BambúBueno. For them it is more beneficial to sell final products like charcoal or napkins because the sale of raw materials has a low profit margin. Of course it is possible that these bigger plantations are more interested when there are more concrete plans for a company like BambúBueno.

We approached several local constructors in El Rama and they were very positive about our plans for BambúBueno, they think it is a great idea to experiment with new materials like bamboo. Even though the local contractors are very positive about the idea, they see also some obstacles. Their main concern was the bad image that bamboo still has, most people still see it as an inferior building material. However, from the 50 home visits that we did we could conclude that 79% of the interviewed people could see themselves living in a bamboo house. We believe that the image of bamboo can change very fast if BambúBueno finds ways to show the people that bamboo can be a very reliable material when it is applied and treated correctly.

The evaluation of this business is part of a new methodology for launching companies, called the "lean start-up". This methodology was introduced by Steve Blank in his paper, *Why the lean start-up changes everything*. In summary, this new methodology can be

explained as follows: “Instead of executing business plans, operating in stealth mode, releasing fully functional prototype, young ventures are testing hypotheses, gathering early and frequent customer feedback, and showing minimum viable products to prospects, This new process recognizes that searching for a business model is entirely different from executing against that model” (Blank, 2013). This early evaluation enables us to recognize problems and flaws of BambúBueno, which gives us the opportunity to pivot the business around to a whole new value proposition for which there is a profitable future.

The block of key partners gave us a lot of insight in the complexity of the project. It shows the different partners that are needed for the business to succeed. Because there are many partners, there are many factors that can disrupt the functioning of

BambúBueno. Therefore, it is important for the business to establish a good relationship with these partners and make clear agreements.

The social costs of this business plan needs some further research because the difference in culture makes it difficult to predict the reaction of the community on this new business plan. It is important that we get a better definition of these social costs by for instance interviewing or questioning the locals.



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