Overview
Casa Congo’s Built Environments Program proposes solutions for equitable development through the utilization of natural materials, based on a deep understanding of the local context and environment. This program aims to build systems and partnerships, empowering the local community to then build and finance their own projects, from prefabricated bamboo factories to green infrastructure.

Since 2017, this program has built Casa Congo’s bamboo school in El Astillero, and provided training/employment to over 20 community members in bamboo harvesting and carpentry. The school site in El Astillero is undergoing constant transformations; this program supports the delivery of physical projects/products needed to run our school programs, as well as delivering externally commissioned projects in line with our mission. Examples of recent projects include various school upgrades, the construction of a turtle nursery, the creation of an outdoor theatre and the development of a bamboo low income housing unit.

Green Design-Build Projects
Our Built Environments team is an international collective of bamboo artisans, engineers, designers and manufacturing experts, who believe in sharing their knowledge with communities disproportionately affected by social inequality.

1. The Regenerative Design branch aims to create places and products in harmony with nature and communities, by adapting design and planning solutions to a locally relevant ecosystem services matrix.

2. The Bioconstruction branch combines the strength of natural materials, such as bamboo, coconut fibre and earth, with cutting edge engineering and project management.

3. The Capacity Building branch drives a user-centric delivery process, including surveys and community workshops, while also providing training and tools to enable project continuity.

4. The Energy & Waste branch focuses on the sustainable operations of the buildings we create, by implementing rainwater collection systems, waste management, solar systems and other closed loops.

Contact & Project Details
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**Agroecology**
Education in sustainable agricultural practices and ecosystem restoration.
1. Agroecology Education
2. Food Sovereignty
3. Ecological Restoration
4. Watershed Management

**Built Environments**
Design solutions for equitable development through the use of natural materials.
1. Regenerative Design
2. Bioconstruction
3. Capacity Building
4. Energy & Waste

**Conservation**
Experiential learning in land and ocean conservation, sociology and policy.
1. Sea Turtles
2. Fisheries
3. Forestry
4. Scientific Research

**Community Development**
A combination of learning modules, social projects, events and creative activities.
1. Participatory Design
2. Social Enterprise & Ecotourism
3. Surf
4. Arts & Culture
From shelters to places, from places to platforms

“2020 was a great year at Casa Congo because I had constant employment that allowed me to economically support my family. Like in every job, there are difficult moments and challenges but nothing that can’t be resolved through dialogue. Thanks to all for the support and wishing you a happy new year”

Alberto Calero
Carpintero, Casa Congo

Research & Innovation
Through collaborations with UBC’s graduate programs and Arquitectura Mixta’s bamboo masters, Casa Congo continuously learns new building techniques. We’re currently focusing on pre-fabricated methodologies.

Sustainable Development
Nicaragua is rich in bamboo and has a unique opportunity to combat both the housing crisis and climate change challenge, by adopting new building systems and training the community. We aim to expand the movement beyond Nicaragua, by organizing experiential learning workshops for international students and volunteers.

Placemaking
Our ultimate goal is to empower Nicaraguans to create beautiful spaces at an affordable price and in harmony with nature, so that communities have adequate places to live, learn, work and play. Casa Congo’s school in El Astillero is a living example of this.
Nicaragua has two main areas where bamboo grows in abundance: the coffee farms in the mountains of Matagalpa (Dendrocalamus Asper) and the natural reserves on the Caribbean coast (Gigantochloa Apus). These two species of locally grown bamboo are adequate for construction and have already been used to build local projects in the areas of San Juan del Sur, Catarina and El Astillero. Nicaraguan authorities have also entered a partnership with the Taiwanese government to develop “Parque de Ferias”, a bamboo center of excellence in Managua. Whilst the material is proven to be structurally successful, Nicaraguan construction codes still need to adopt it in their standards.

This program’s remit goes beyond bamboo via constant exploration of sustainable construction models, closed loop systems and energy solutions. Nonetheless, bamboo has become our key focus due to its abundance in Nicaragua and rapid growth cycle (3-5 years). The construction industry is responsible for 40% of global CO2 emissions. Bamboo buildings store carbon, allow for end of life recycling and lends itself for off-site prefabrication.

<table>
<thead>
<tr>
<th>Bamboo specie</th>
<th>Flexure fx (N/mm²)</th>
<th>Shear fx (N/mm²)</th>
<th>Tension fx (N/mm²)</th>
<th>Compression fx (N/mm²)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dendrocalamus Asper</strong></td>
<td>35-50</td>
<td>3-5</td>
<td>40</td>
<td>35</td>
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<tr>
<td>Diameter: 9 - 18 cm</td>
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<tr>
<td><strong>Gigantochloa Apus</strong></td>
<td>30-40</td>
<td>2 - 3</td>
<td>40</td>
<td>20</td>
</tr>
<tr>
<td>Diameter: 4 - 13 cm</td>
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Please note mechanical properties are highly dependent on growing conditions of bamboo and need to be tested to be confirmed. Assume 12% moisture content within mature age for species (3-5 years).
**2021 Project #1, Ku Na**

**Budget: USD $200,000**
Kuna comes from ancient mayan yucatec and means “house of nature”. This project is Casa Congo’s response to the global housing crisis, currently touching over 100 million people worldwide who are homeless and over 1 billion people who have inadequate shelter.

Thanks to our partnership with [ANF](#) and [Arquitectura Mixta](#), Casa Congo will be developing a bamboo micro-factory and delivering 20 x social houses with agroecological gardens to families who lost their homes in hurricane Iota in 2020.

Kuna’s 2021 fundraising target is $200,000 of which 60% has been already been secured.
Budget: USD $4,700
Thanks to our partnership with UBC’s Faculty of Forestry and Applied Science, a group of architectural students teamed up with Casa Congo to design a seed and tree nursery for our Centre of Agroecology in El Astillero. This venue will also act as an outdoor classroom and experiential workshop space.
The project will be built entirely out of local bamboo and recycled materials in Q2-Q3 2021.
The Vivero’s fundraising target is $6,000, of which 100% has been secured thanks to a research grant from UBC.