

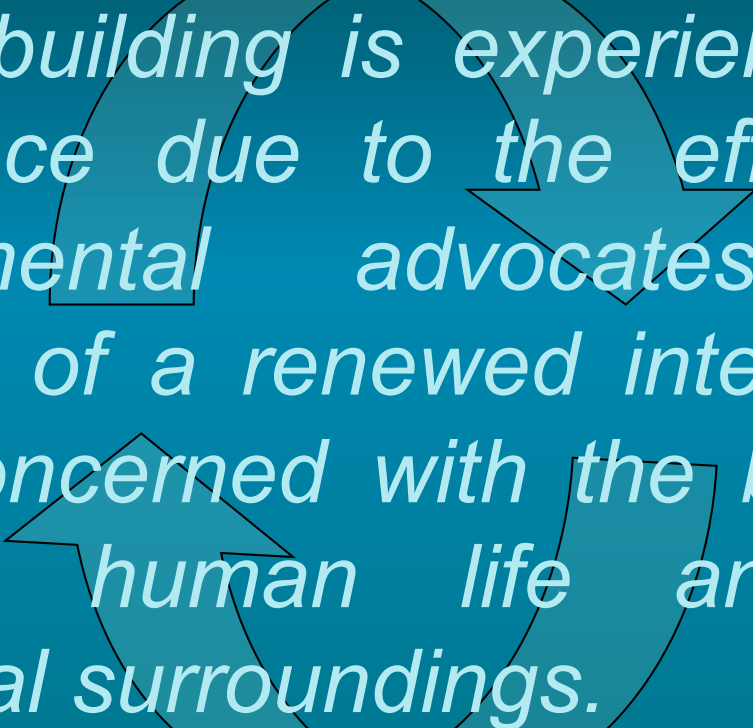


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**"CASITA DE TIERRA" NATURAL
BUILDING AND DRY BATHROOM
SAN JUAN DEL SUR – NICARAGUA**
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**I Pro-Africa Conference: Non-conventional Building Materials
Based on Agroindustrial Wastes**
Pirassununga - SP, Brazil, 18 - 19 October 2010
FZEA/USP

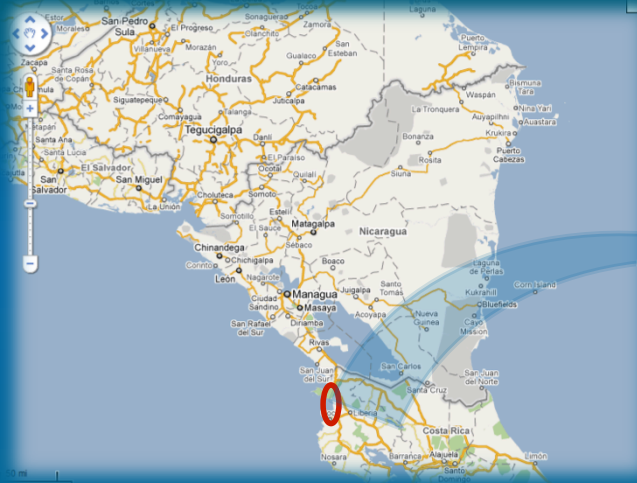
NATURAL BUILDING



Natural building is experiencing a resurgence due to the efforts of environmental advocates and because of a renewed interest by those concerned with the balance between human life and our ecological surroundings.

In this particular case, we built a small house near the beach using construction techniques based on earth bags, natural plasters, an earthen floor, and a dry bathroom system.

Nicaragua – Central América

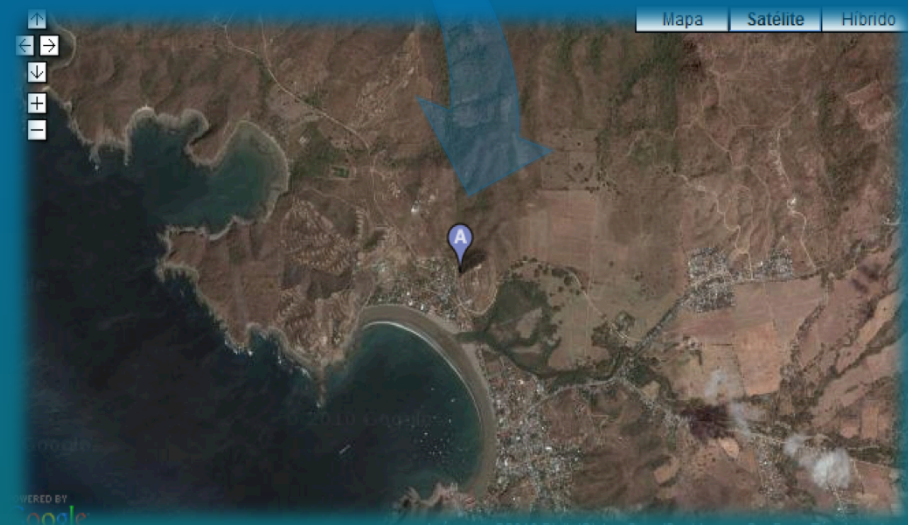


• Population: 5.465.100 Hab.

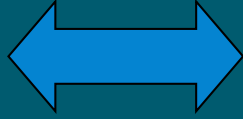
• Temperature
27 °C - 32 °C winter (May-Oct)
35 °C y 40 °C summer (Nov-Apr)

San Juan del Sur

- Population 17,104 hab.
- 92 msnm



Tourism



Habitants





**DESIGN AND
BUILDING
TECHNIQUES**

**SUSTAINABLE
AND LOCAL
MATERIALS**

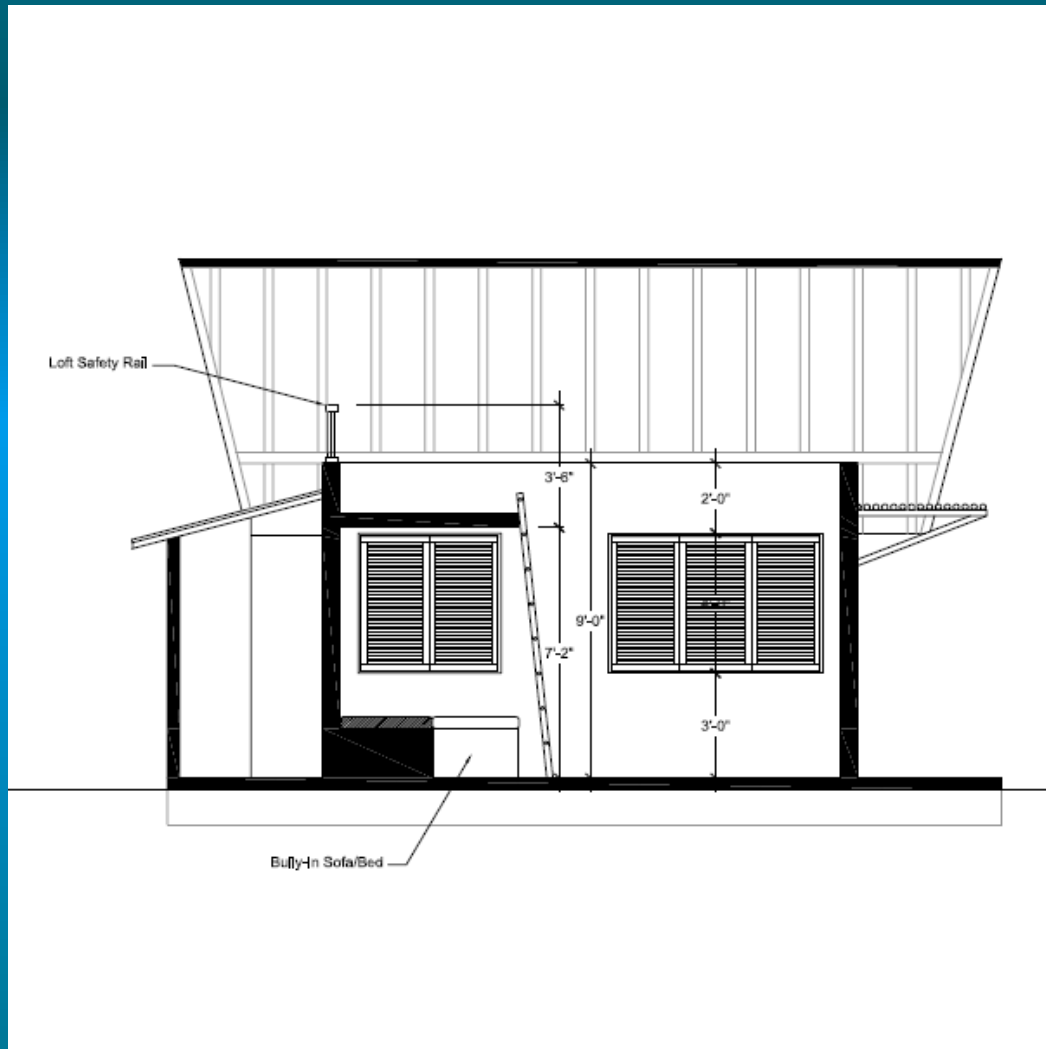
**LOCAL AND
TECHNICAL
KNOWLEDGE**

- **EARTH BAGS**
- **NATURAL
PLASTERS**
- **DRY BATHROOM**



- **REDUCTION OF COSTS**
- **FUNCTIONALITY**
- **VERSATILITY**
- **ADAPTABILITY**
- **COMFORT**

DESIGN



FOUNDATION

Rubble Trench



- *Excavated 18" deep around the footprint of the structure*
- *Lined the trenches with drainage cloth*
- *Ran 4" diameter PVC tubing at the bottom, and sited them to drain to daylight*
- *Filled the trenches with gravel*

THE WALL SYSTEM

*Setting & Filling
bags*



Tamping of bags



Laying barbed wire



50 pound bags used to
complete the remainder of
the walls

100 pound poly-propylene bags
were laid for the first seven
courses

100 lb. bags
stabilized
with 7% lime
by volume

Reinforcing lateral strength between bags

THE WALL SYSTEM



Maintained a minimum of 3 feet of wall space from corners to doors and in between windows



Bond beam connecting the roof to the wall system



Wood & Cane strips



Bailing cords

Laminate Zinc & Palms



- *Ventilation system*



- *Indoor roof*



Electrical System



Results after 2 - 1/2 months of building!