

the
vegetable
of the

future

Acknowledgments:

Architects without Borders,
Andrea Fitrianto

at ITB Bandung
Andry Widyowijatnoko

**Bamboo,
Nature and Business?**

Jorg Stamm
stammboo@hotmail.com

German Carpenter, CAD programming and «Computer Controlled Processing»



Software and Mobile



EXPO-Mundial en Hannover - 2000, ZERI-, Building Permit only temporary

Designer Linda Garland ?
Invited for Bamboo Workshop

Simón Vélez,
Bambusero con Aureola



Scalded Model 1:1 = Prototype

Greenschool y Greenvillage

Upgrading: highly added value,
Little volume



“Innovation” ,
- open for new markets, just natural poles





Ethiopia – 2012: African Bamboo/GIZ: Bamboo Sector Development



Bamboo flooring and Strand Woven Boards

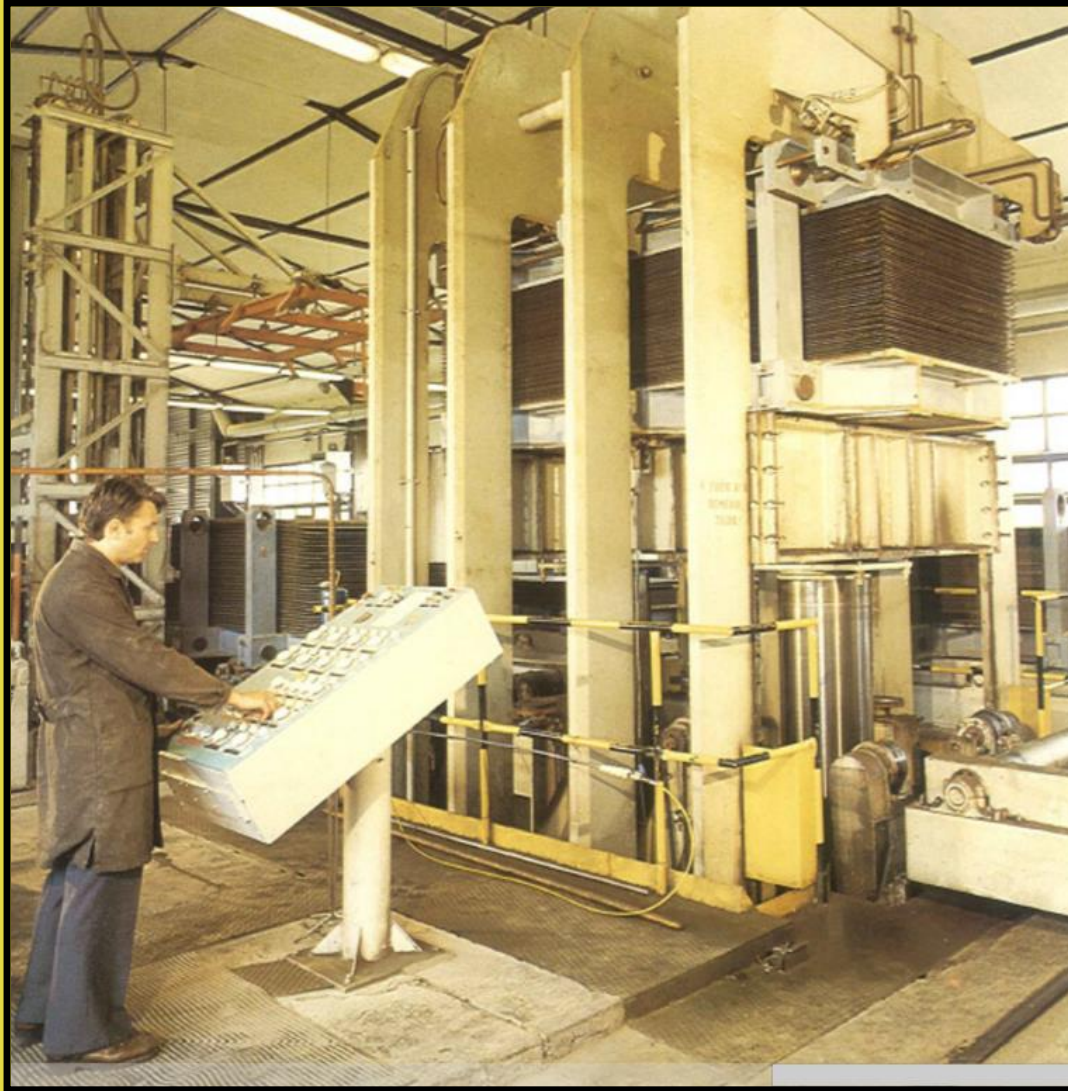


Bamboo fiber: the fuel for reforestation projects

One container exported
pays for one hectare planted



Cement board Technology with Bamboo Fiber is «simple» yet big investment?



Downgrading =
of 100.000 tons
dry mass /year



Gilds - Carpenters over the Centuries

Craftsmen =
Art of converting
Nature into Culture



“Experimental Archeology” –

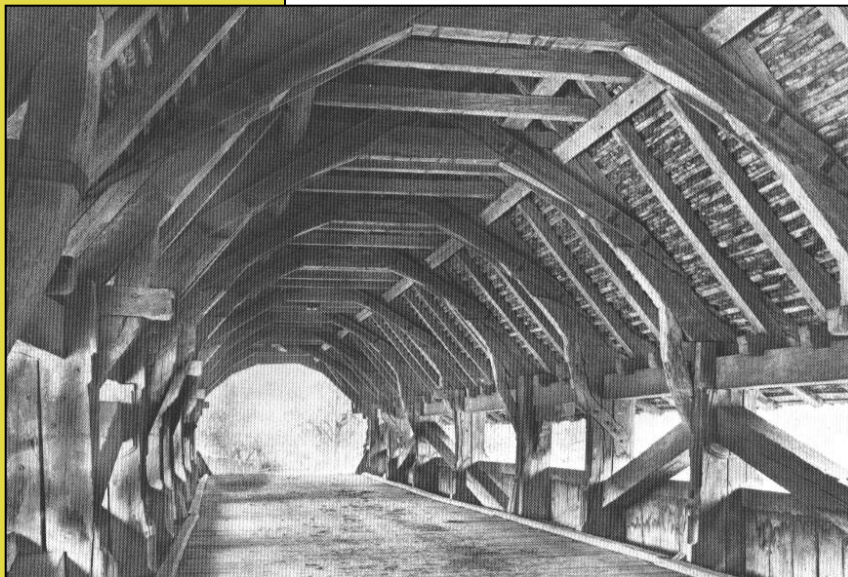
Reconstruction of Celtic dwellings with
Original techniques materials and tools.



Johan Grubenmann, year 1760, - the Master of Wooden Bridges

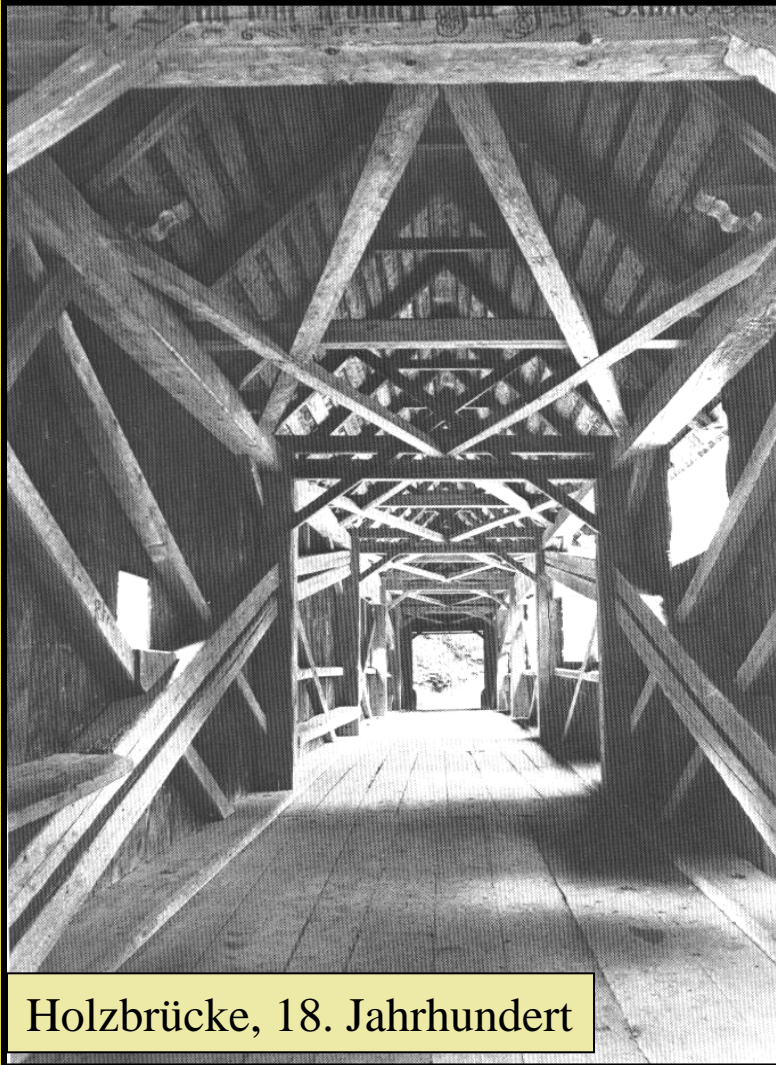


Rheinbrücke bei
Schaffhausen, 117 meter



500 años de tráfico pesado, Gümnenen,
Schweiz

Technology Transfer from Wood to Bamboo



Holzbrücke, 18. Jahrhundert



Bambusbrücke, 21. Jahrhundert

Bamboo is curved, - so think curved!
Facultad de Ciencias Ambientales, UTP
University of Pereira, Colombia 1999



Maintenance free and user-friendly!



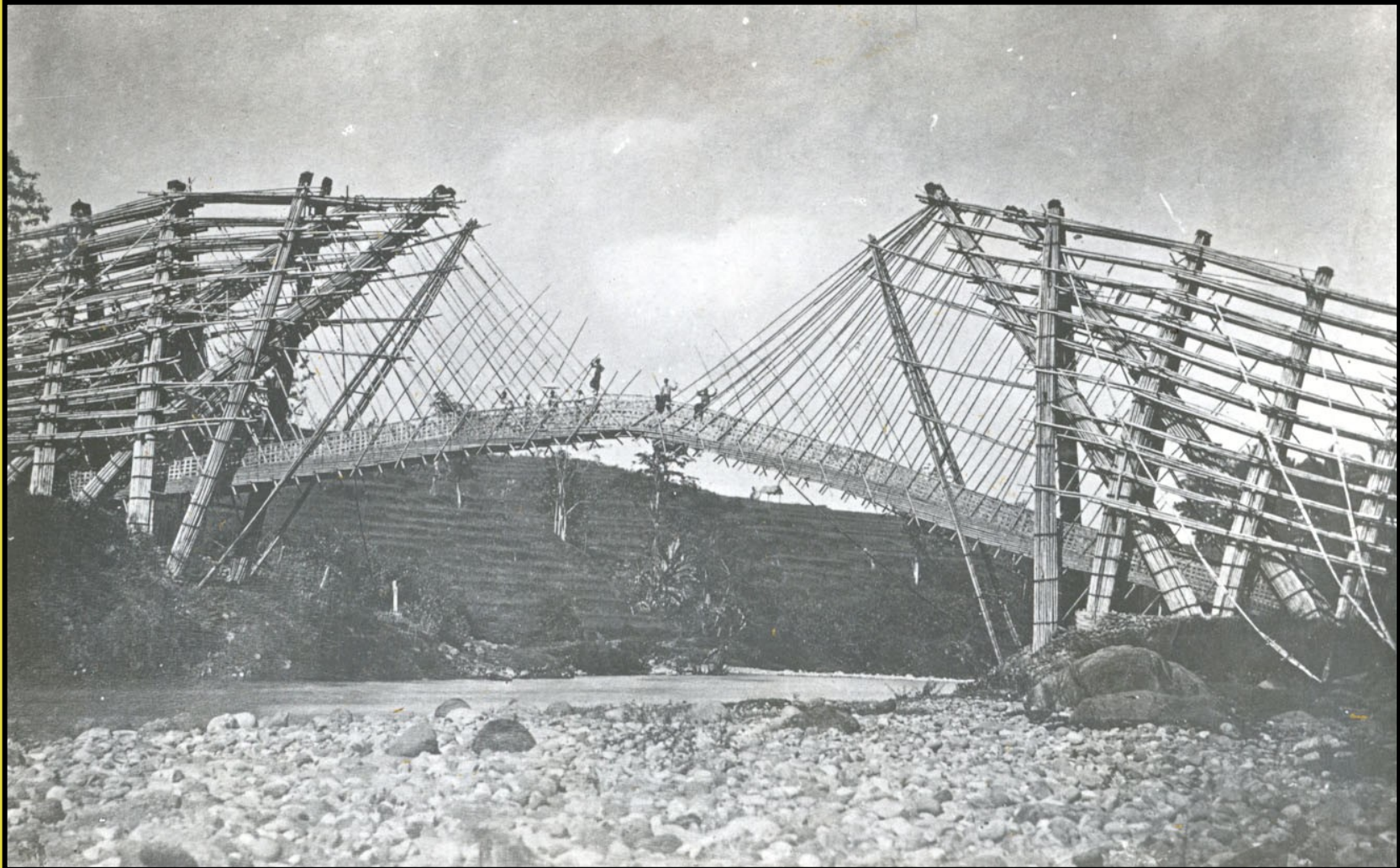
Eco-engineering with giant grass



16 10 2005



Bamboo bridges with a tensile concept in Indonesia













DK 756 YL
01-08

Sibang Bridge at Greenschool

20 meter, Arch + Cable Stade Bridge, Bali, Indonesia 2008



Inspiration for a bio-climatic house or hotels in tropical climate





Bamboo bridges with a tensile concept in Colombia similar to Indonesia



Bamboo Sculpture for Urban Environment



Big arches are easier to make than small ones



Bamboo Pin or Dowel



Lifting with two cranes





Working in unusual conditions



Grouting



Cracked bamboo is splitted and joined for Flooring



Load test with 200 litres per square meter



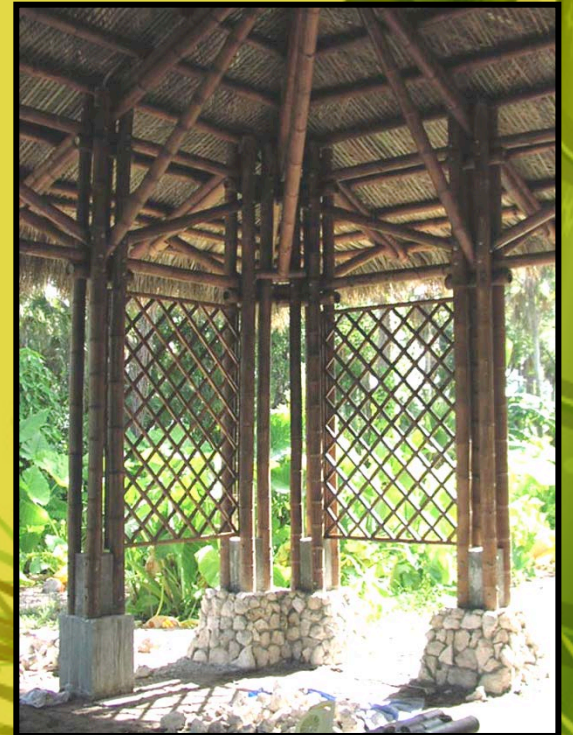
Naturally Curved bamboo beams, joined as a 6 Pack



Modern Design & high tech materials



First Bamboo structure in Florida



- Construction permit by City hall Vero Beach
- Survived two hurricanes without damage in 2004
- Protection of natural habitats by sustainable materials

Self supporting Spans - Design of “Organic” Construction

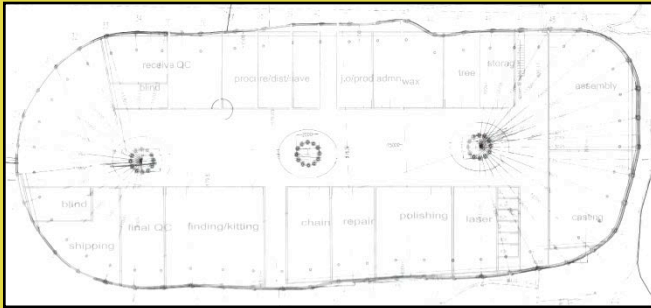


Living in a bamboo forest

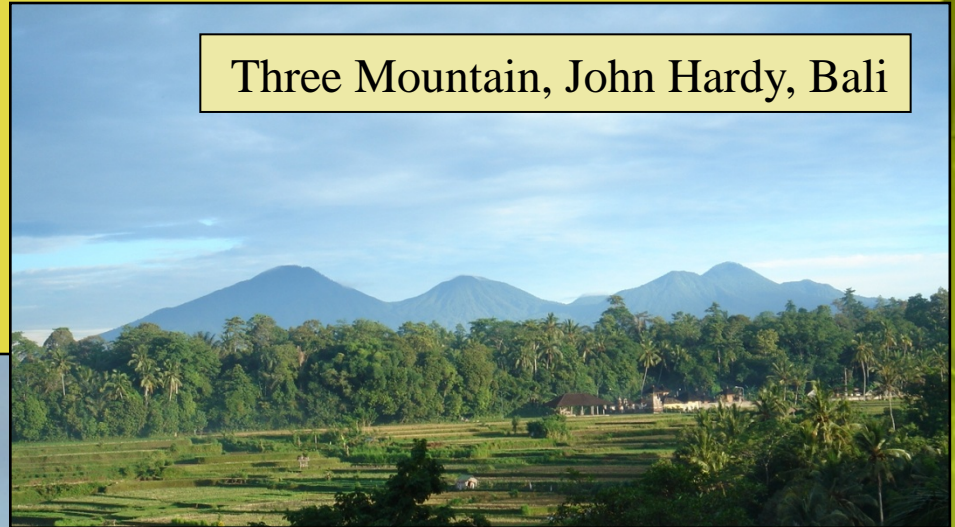


Greenschool Teacher houses, Bali

Nature as inspiration



Three Mountain, John Hardy, Bali





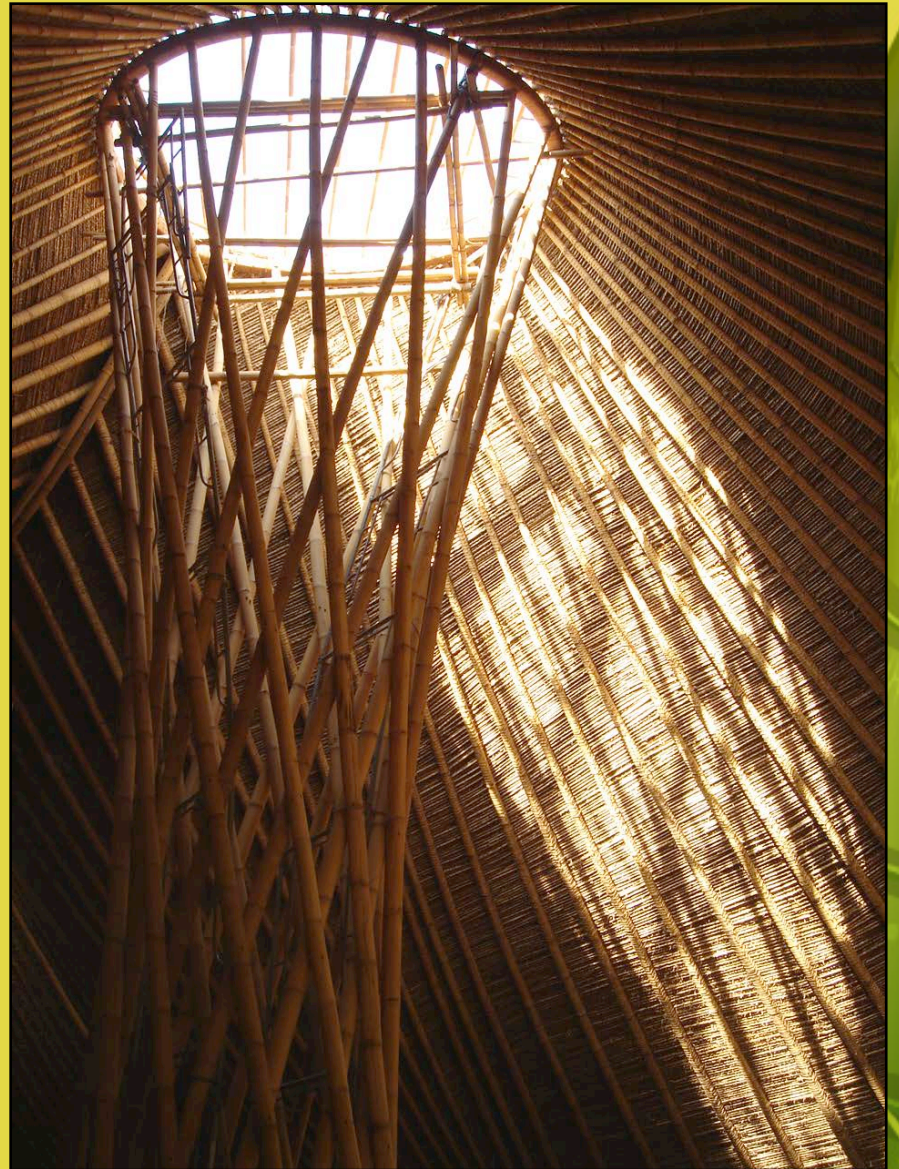




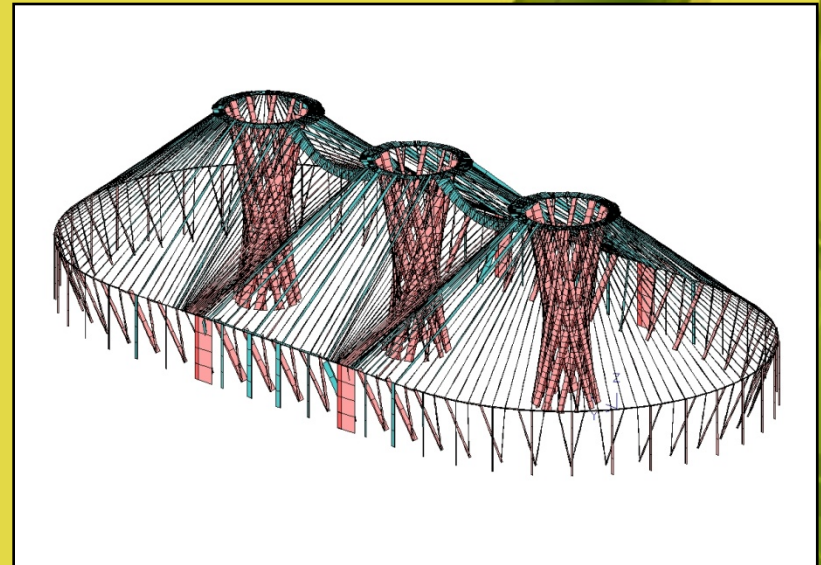
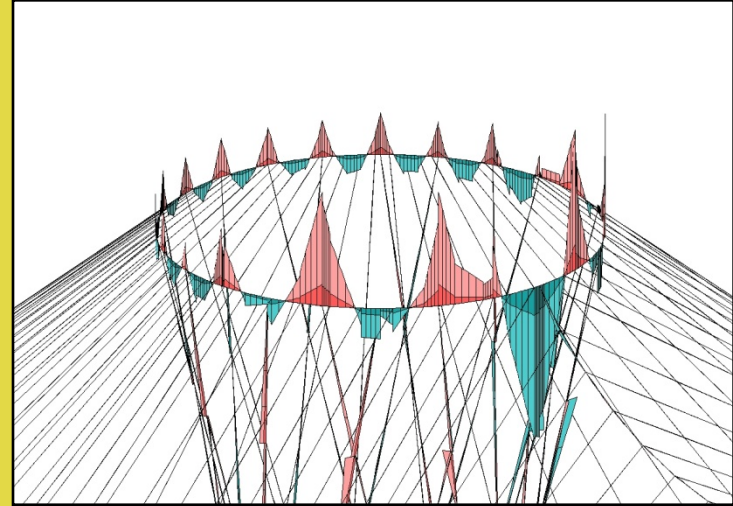
Bamboo nails for joinery



Light Effects



Structural load analysis with TH Erfurt



Natural air convection for tropical climates



Bamboo roofs and bioclimatic Architecture

Only incense Ceramics
as tropical countries
don't leave tangibles



Palm roofs and curved ridge beams



Punta Blanca: a replica of 2500 year old Ecuadorian heritage



Bio- Arquitectura + Eco engineering or simply: - nice work in warm climate



Natural convection, Batak Style.

Ecolodge Bukit Lawang



Bamboo at EcoLodge in Sumatra. Orang Utan conservation, Leuser National Park, Indonesia.



Swiss Architect and Carpenter: Lukas Zollinger

Sumatra, Orang Utan Eco- Lodge



Thanks !

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“Bambuseo”
at Panama’s
BioMuseo

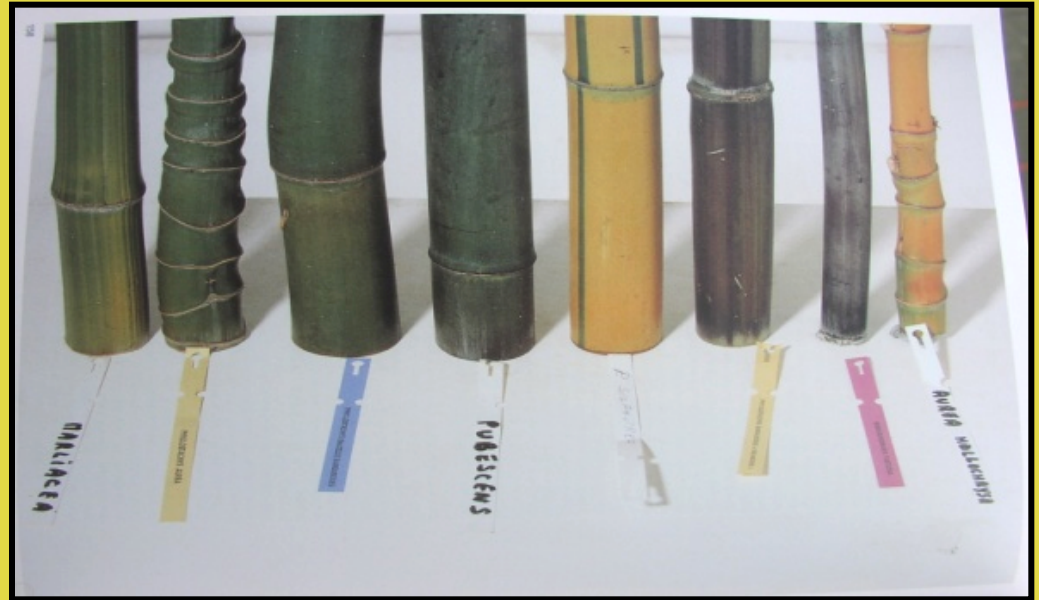


My favorite Books:

- Bamboo- Bambus, IL 31, Frei Otto Institute
- Gift of the Gods, Oscar Hidalgo L.+
- Bamboo Construction Manual, Gernot Minke

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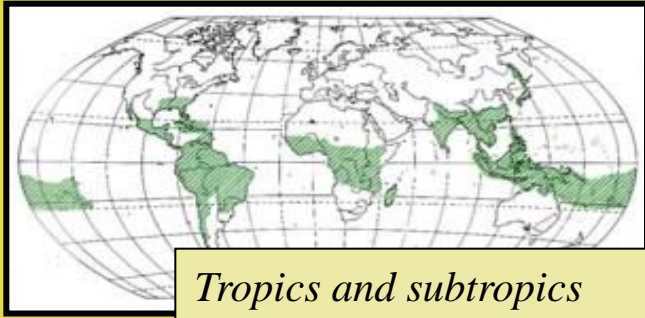
future



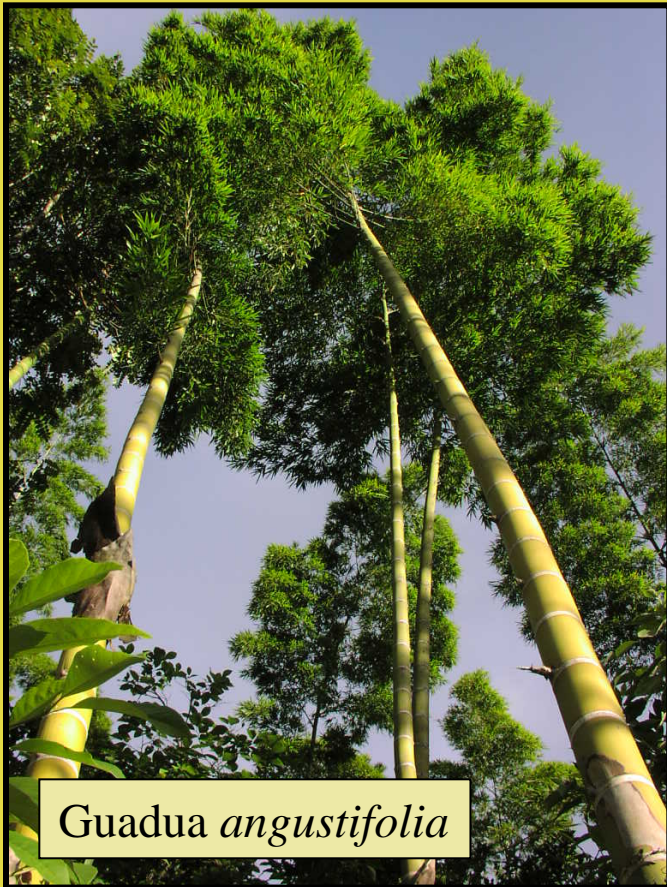
1. Why Bamboo?

- species and it's data
- sustainable harvesting
- preservation techniques

Slender Poles, but: 1250 Species, 46% in America.



Tropics and subtropics



Guadua angustifolia



Gigantochloa sinicus

Secondary forest as Ecological Niche

Guadua grows well
from 0 – 2200m

In Amazon and Pacific

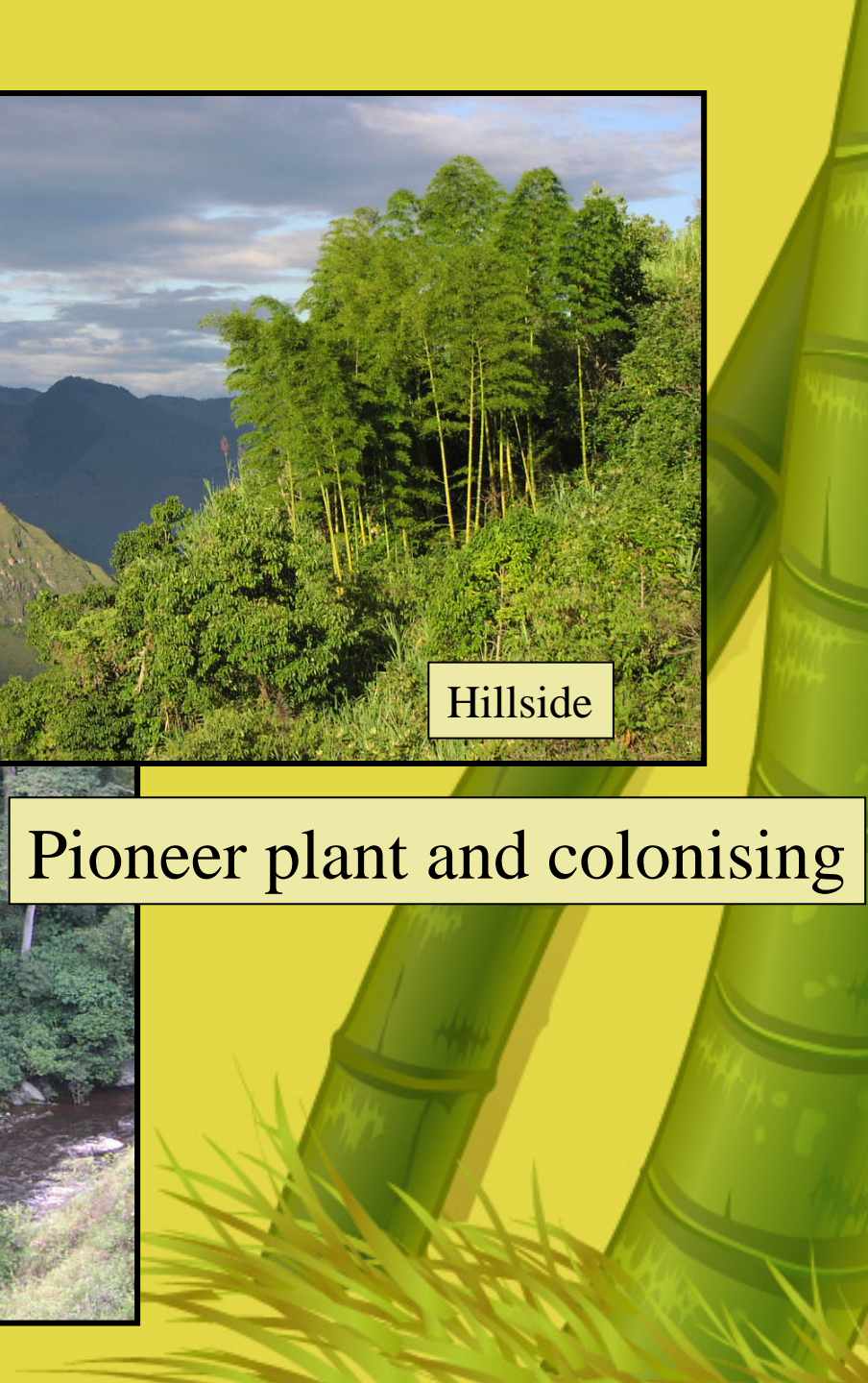


Hillside

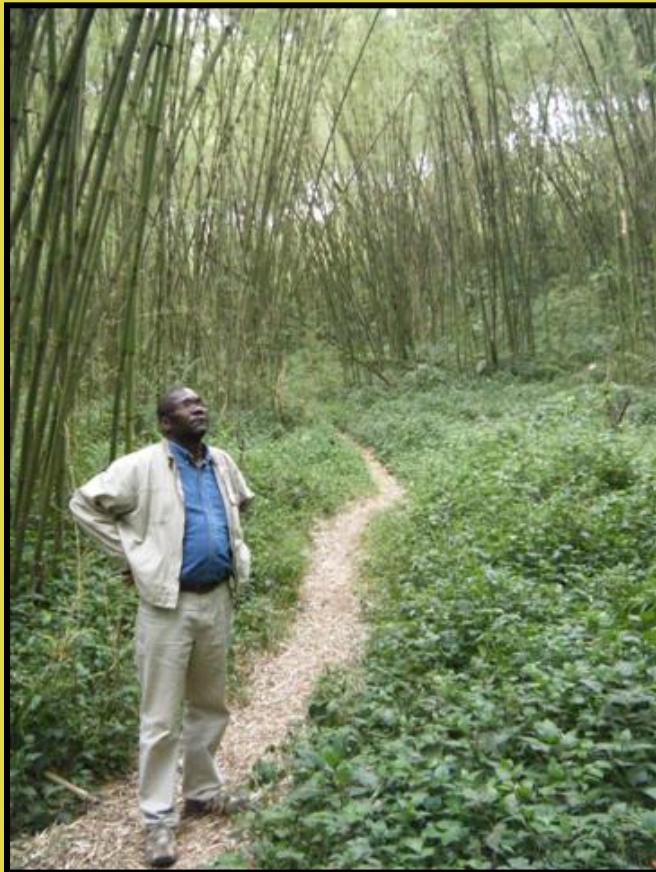


Riverside

Pioneer plant and colonising



Highland Bamboo: *Yoshania alpina*, growing over 2500 m, in Ethiopia, Kenya, Ruanda etc



Farmland versus Bambooforest

Lowland bamboo as cash crop?
about 1/2 a million hectares
have to compete with traditional crops



Oxitenanthera abyssinnica

Bamboo Preservation

Water based chemicals : Borax + Boric acid

with 5% Boron Solution:

Vertical Diffusion (7 days)

Horizontal Dip Diffusion (4 days)

Hot dipping (3 hours)

Modified Bouchery (30 minutes)



Oils based chemicals: and Free Mite ? etc.

Preservation: Boron salts by Diffusion (Osmosis)

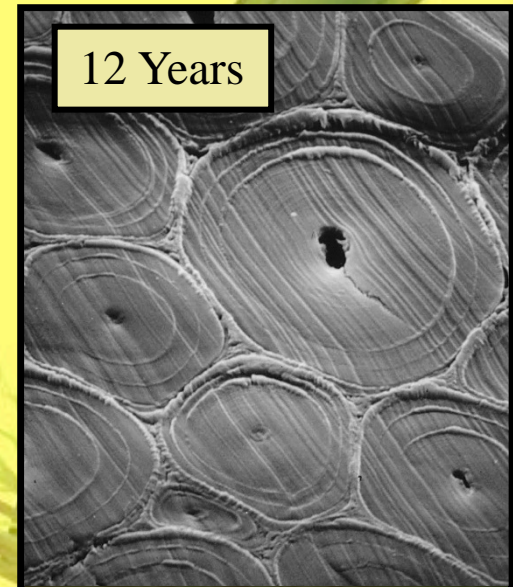
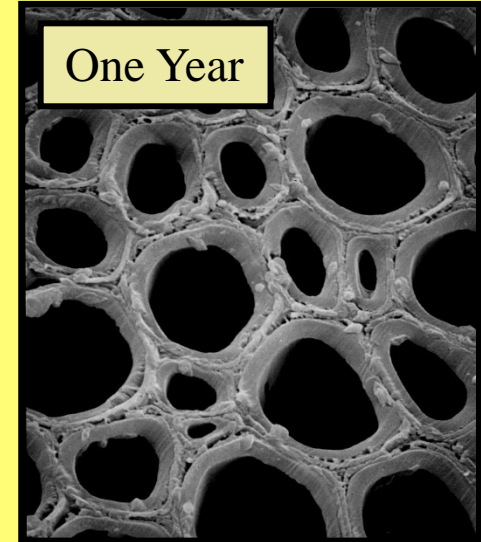
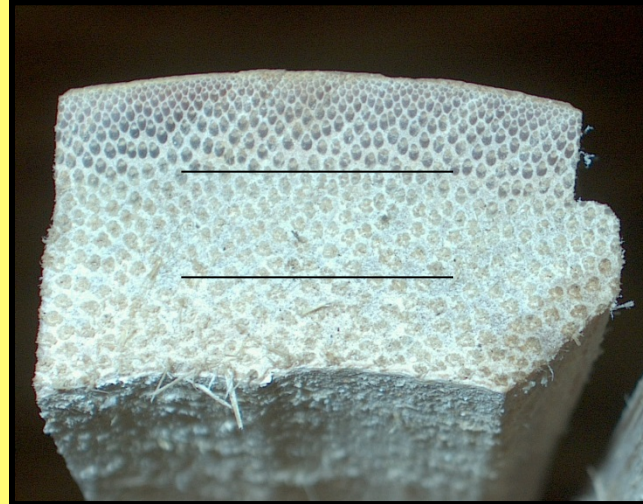


Grading by diameter and straightness



Anatomy - Natural Tube

with mayor strength on the outside



The hole in Diaphragma

the
vegetable
of the

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2. How to «bamboo»?

- traditional /modern joints
- suitable structural systems
- contemporary Design

Weaving: Basket – or «Bee hive»



**Big Span
Bamboo ?**

Skill evolution in thousands of years



- Inner layer
is formgiving
- Middle layer
is heat & rain insulation
- Outer layer
is wind and UV protection

Bamboo nails for joinery



Prefabrication of Columns, Rafters and Purlins



Truss assembly over a Matrix

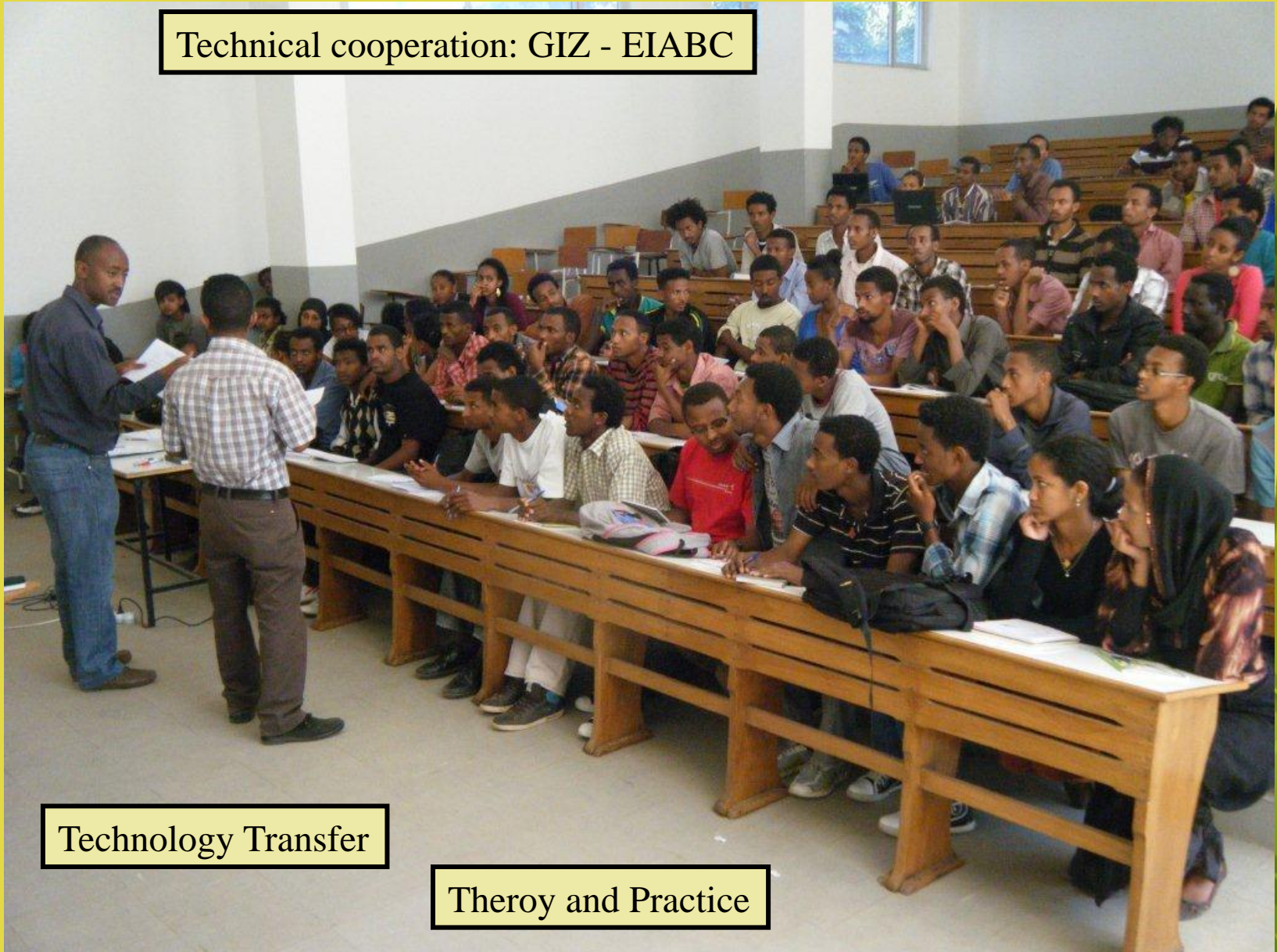


Light weight structure, 200 m², 1 Week with bamboo with *Yushania alpina*, Ethiopia



Architecture, Engineering, Management

Technical cooperation: GIZ - EIABC

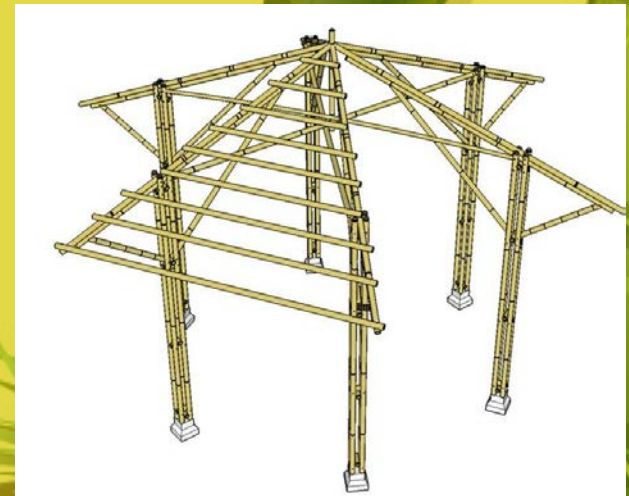


Technology Transfer

Theroy and Practice

National Bamboo Construction Center at Addis Ababa University

EiABC- Chair of Sustainable Building Materials



“Hands on” experience



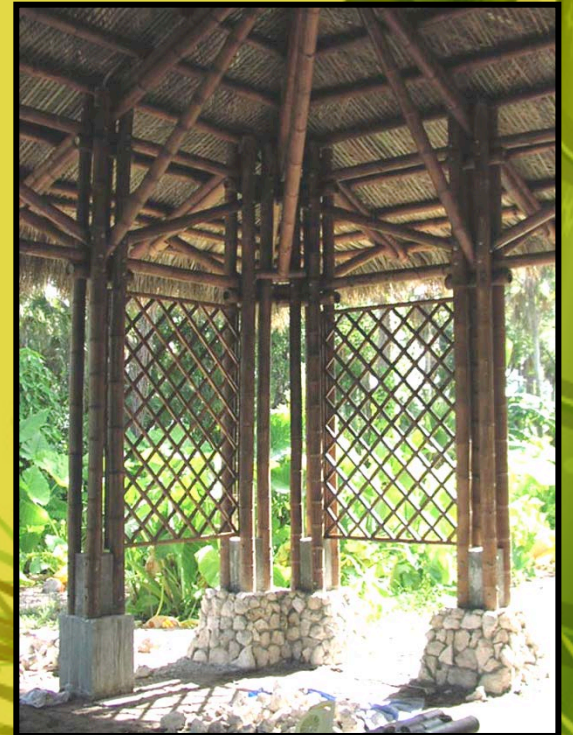
Time efficient construction methods



What is next?



First Bamboo structure in Florida



- Construction permit by City hall Vero Beach
- Survived two hurricanss without damage in 2004
- Protection of natural habitats by sustainable materials

School for Life, Cali - Colombia

Architect: Andres Baepler



«Fish belly truss» and woven walls



Space frame with «pencil joint»



«Hangar» with Membrane



Protection by design



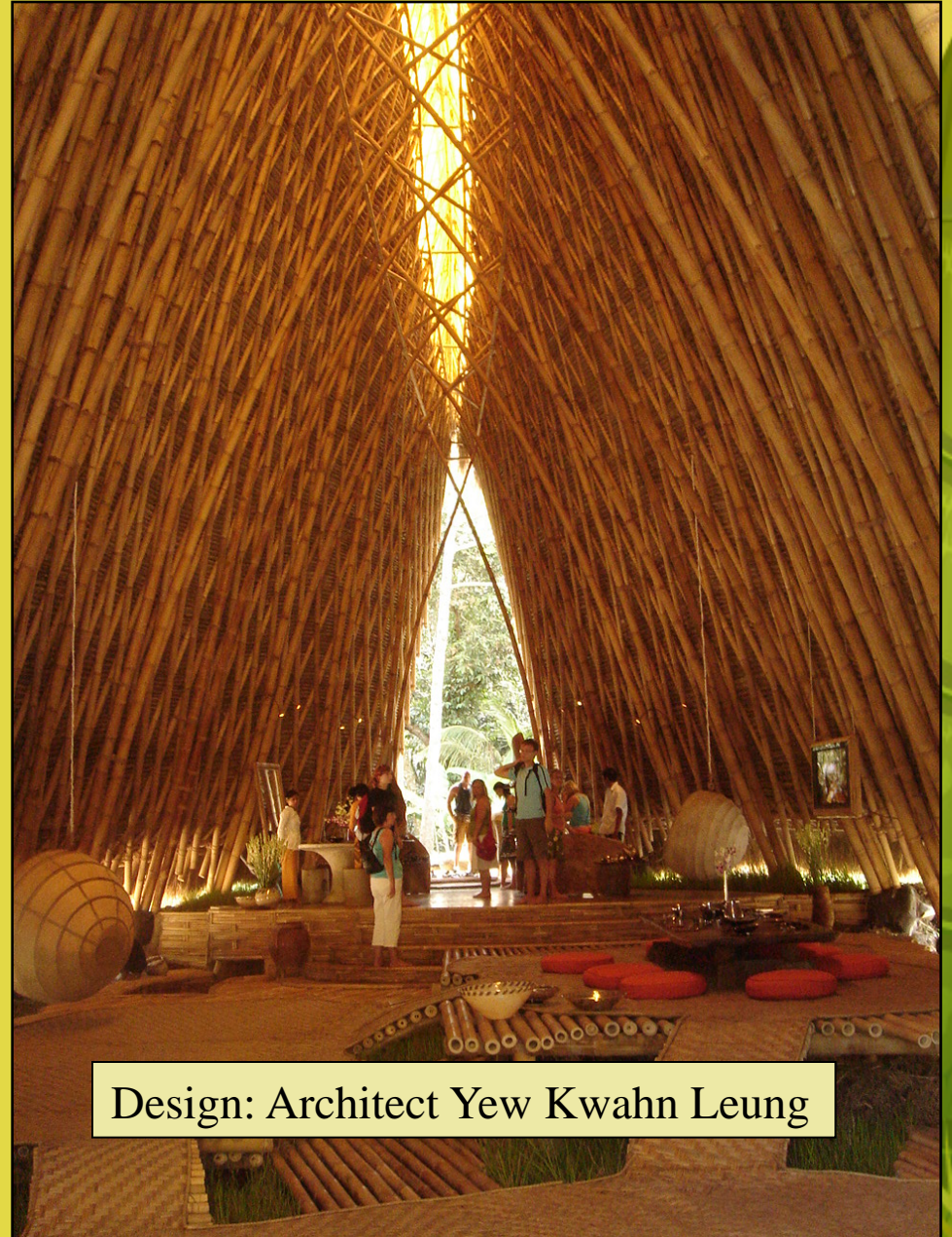
Double Shell and Rhombus



Grid structures over Oval lay out

12 x 25 m, 15 m height.

Capal Bambú



Design: Architect Yew Kwahn Leung

Hábitat Natural ?

Capacidad de Adaptación



Propagación vegetativa, Planta pionera

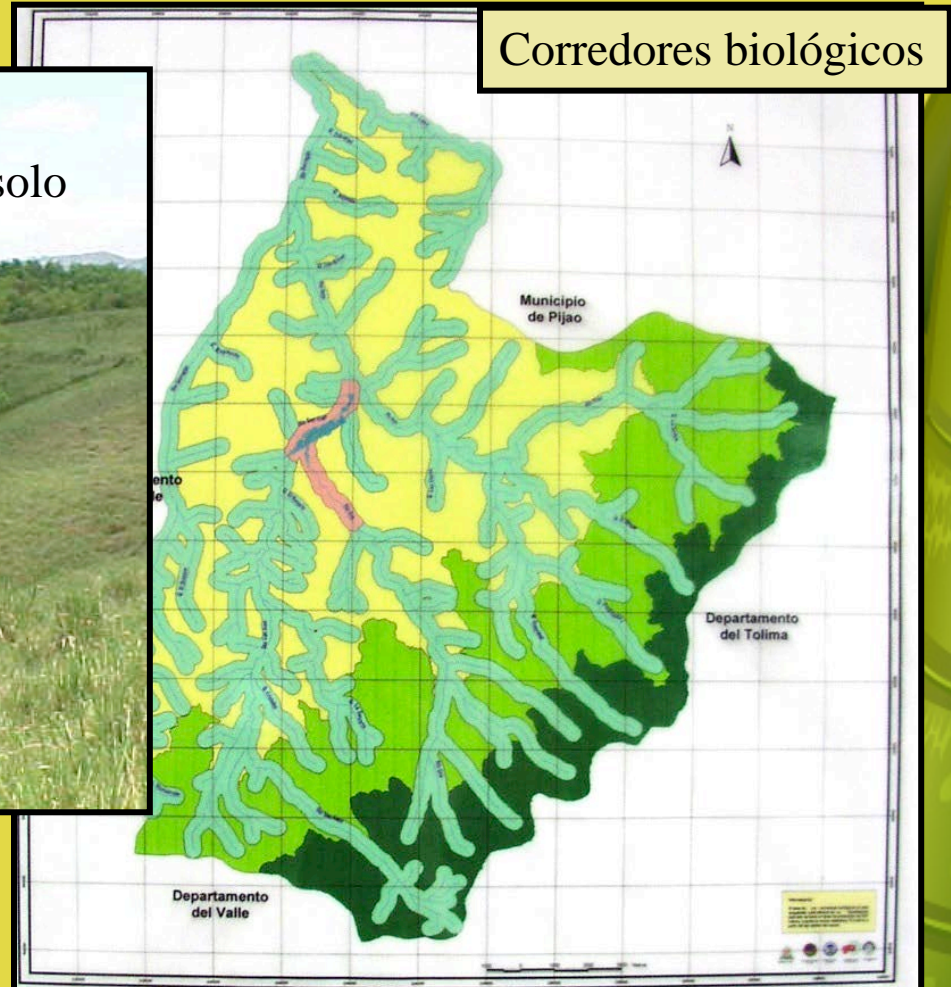
Línea de re-siembra en drenaje natural,
la guadua lava sus nutrientes y “sube” solo

rocío

Vocación de terreno



Corredores biológicos



un container exportado
- una hectárea sembrada



Thanks ! www.ecobamboo.net
Email: joerg@joergstamm.com



My favorite Books:

Bamboo- Bambus, IL 31, Frei Otto Institute

Gift of the Gods, Oscar Hidalgo L.+

Bamboo Construction Manual, Gernot Minke

