Bamboo: A sustainable construction material for the 21st century

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Global Bamboo Housing Programme

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Contents

- Traditional uses of bamboo architecture
- Challenges to make them mainstream
- Some good practices

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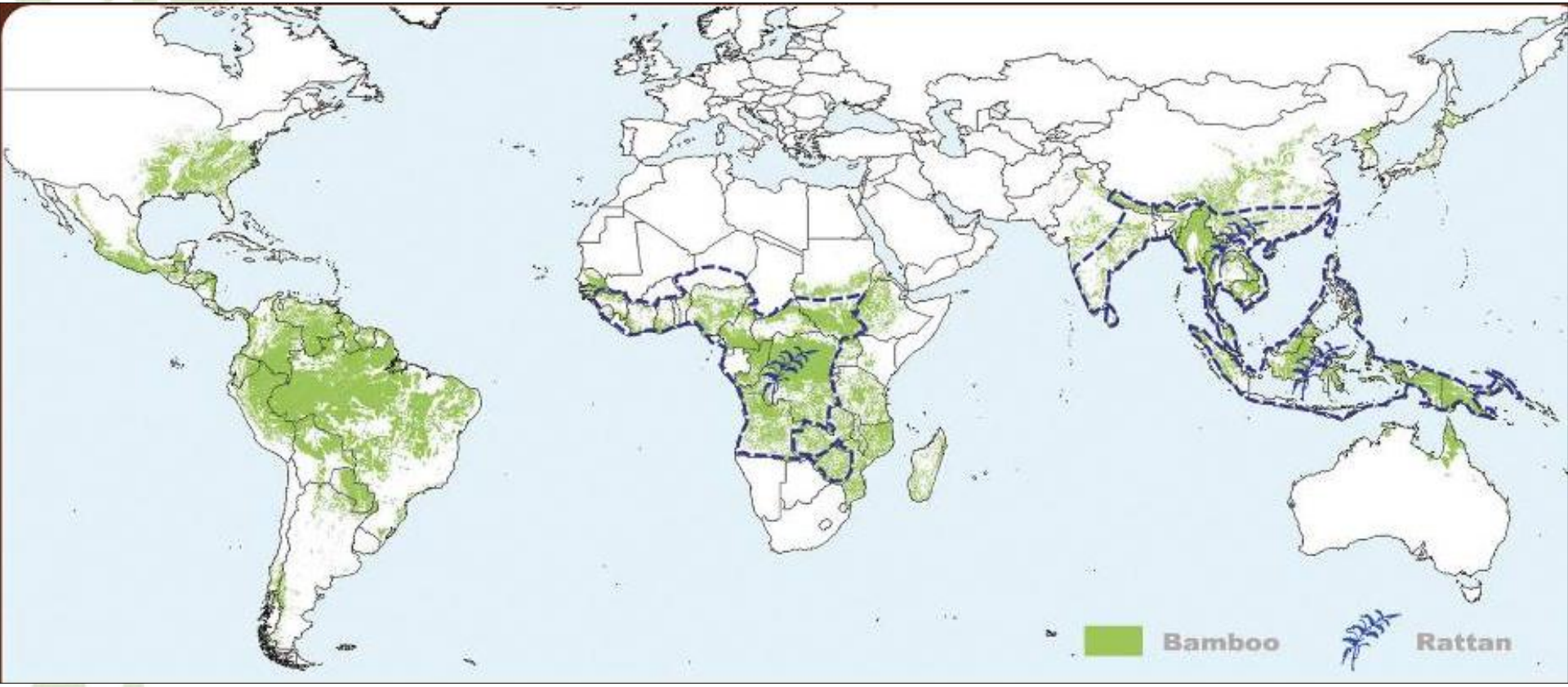
INBAR Mission

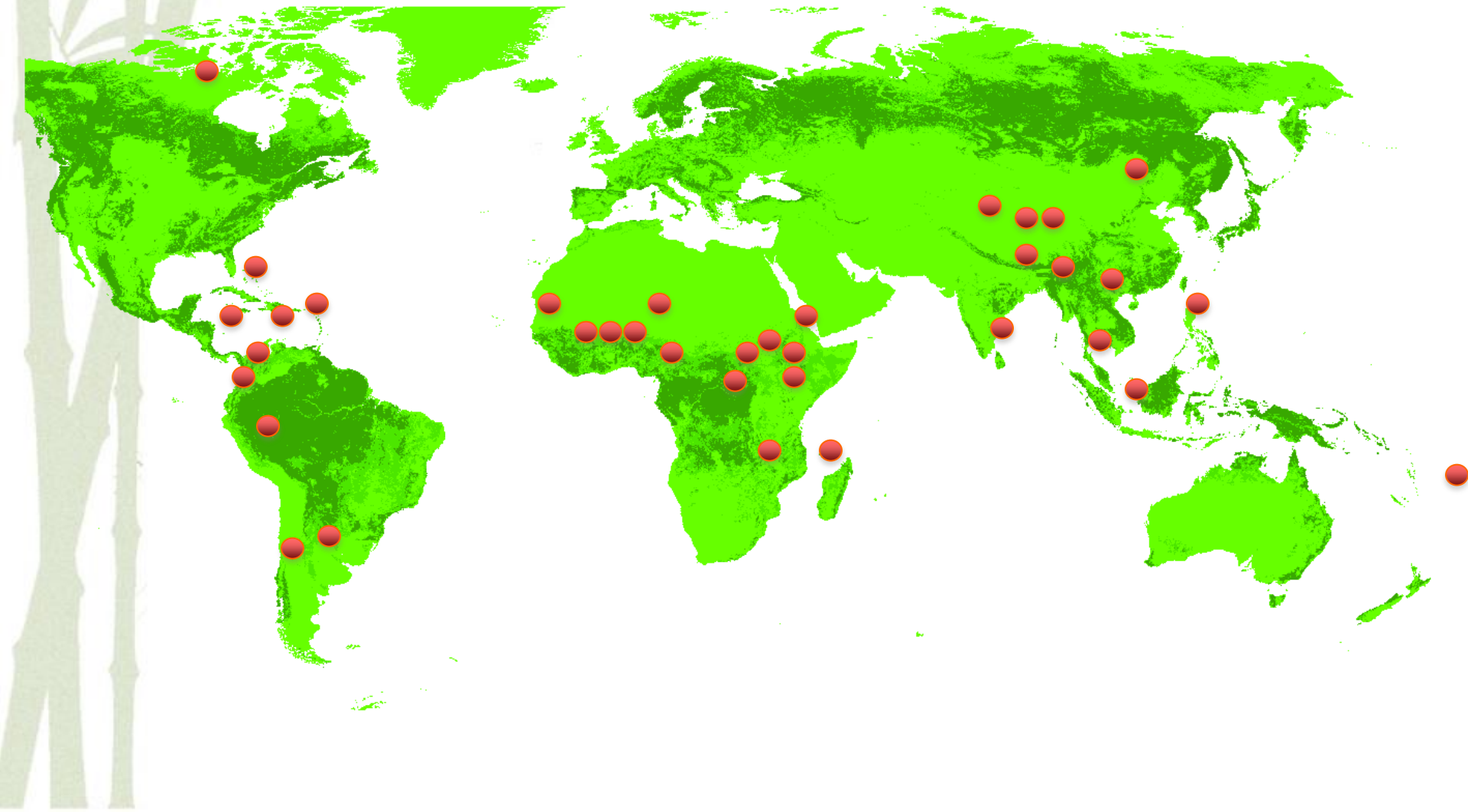
To Improve the well-being of the producers and users of bamboo and rattan within the context of a sustainable bamboo and rattan resource base

Bamboo and Rattan Resources

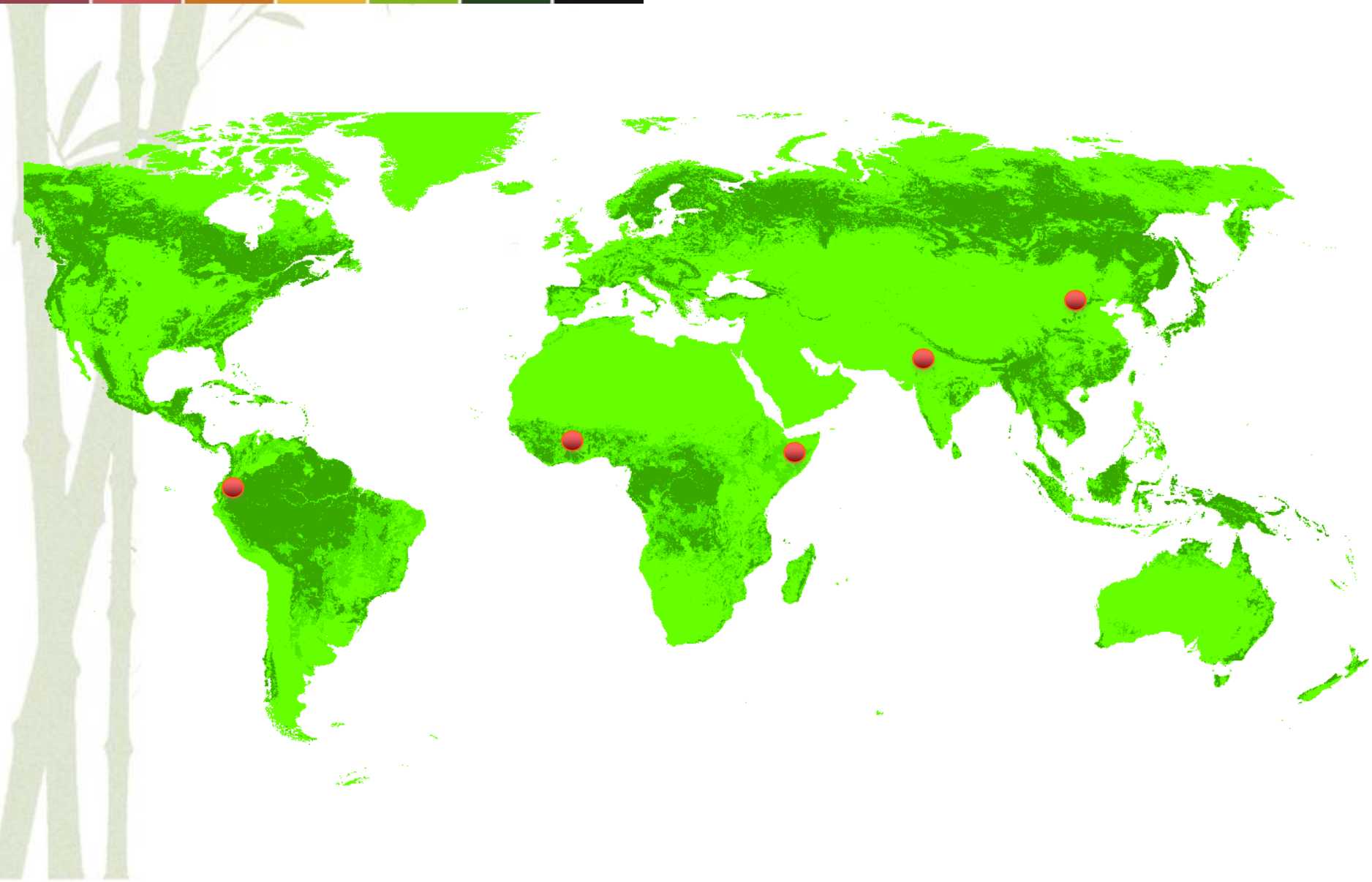


Source: Bamboo and Rattan in the World (Jiang 2007)

INBAR Member Countries



INBAR Regional Offices



Global Bamboo Housing Programme

- Consolidate, coordinate and support strategic and adaptive research and development
- Disseminate knowledge on how bamboo-based construction can be applied to poverty reduction and more resilient homes and communities
- Support the development of markets for bamboo-based construction

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Why Bamboo?

Bamboo matures in 3-6 years.

It takes 60 days for bamboo to grow 60 feet.

Earthquake resistant properties e.g. Costa Rica (7.6 Richter Scale)

High insulating property.

Economical

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Some Modern Examples

A big question

- So what does it take for bamboo to become a mainstream material?

Challenges to supply chain

Challenges to making bamboo mainstream

- Supply Chain
- Proper Harvesting regime
- Appropriate Treatment
- Appropriate Joinery & Craftsmanship
- Supportive Policy

Appropriate Treatment

Untreated bamboo

Cheap, fast, effective: buy it today, use it today. Biodegrades: lasts for 1-3 years depending on exposure.

Treated bamboo

Has a 20-30yrs life expectancy if correctly harvested, handled and treated, and sheltered from weather in use. Hence offers a greatly increased contribution to community resources.

Source: Humanitarian Bamboo , 2009

Appropriate Treatment

Appropriate Treatment

Source: abari.org

Appropriate Joinery & Craftsmanship

- Joints often weakest part of bamboo structure
- Joints require specialized skill
- Very labour intensive process
- Few tools dedicated to bamboo

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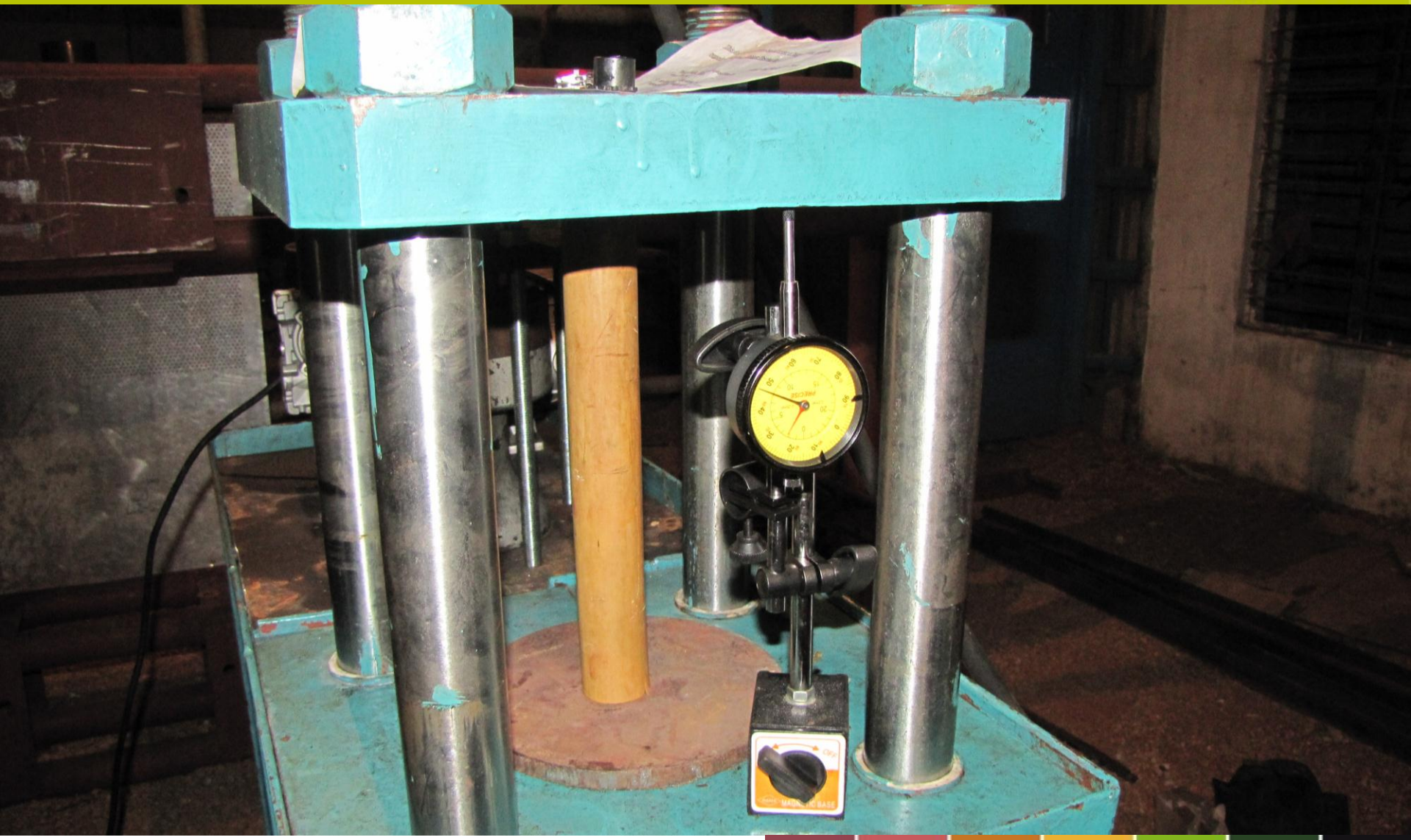
Appropriate Joineries:

Source: Jorge Moran adaptation Simon Velez

Appropriate Policies:

Key Policy Issues	Examples of Good Practice
Standards and Building Codes	2 ISO standards; National building codes approved in Peru & Columbia;
Resource Management	India recently declared it as grass. Bamboo placed on commercial species list in Ecuador
Finance for bamboo smallholders	Indira Awas Scheme, India
	Anji County, China



IIT Delhi , India

Case Study 1: Janakpur, Nepal

Life School Center, Janakpur, Nepal

Adobe and Bamboo Research Institute

Project Objective:

- Demonstrate use of local materials for construction of public structures like school, community kitchen, training hall and office spaces.

- Impart livelihood skills to locals during the construction process.

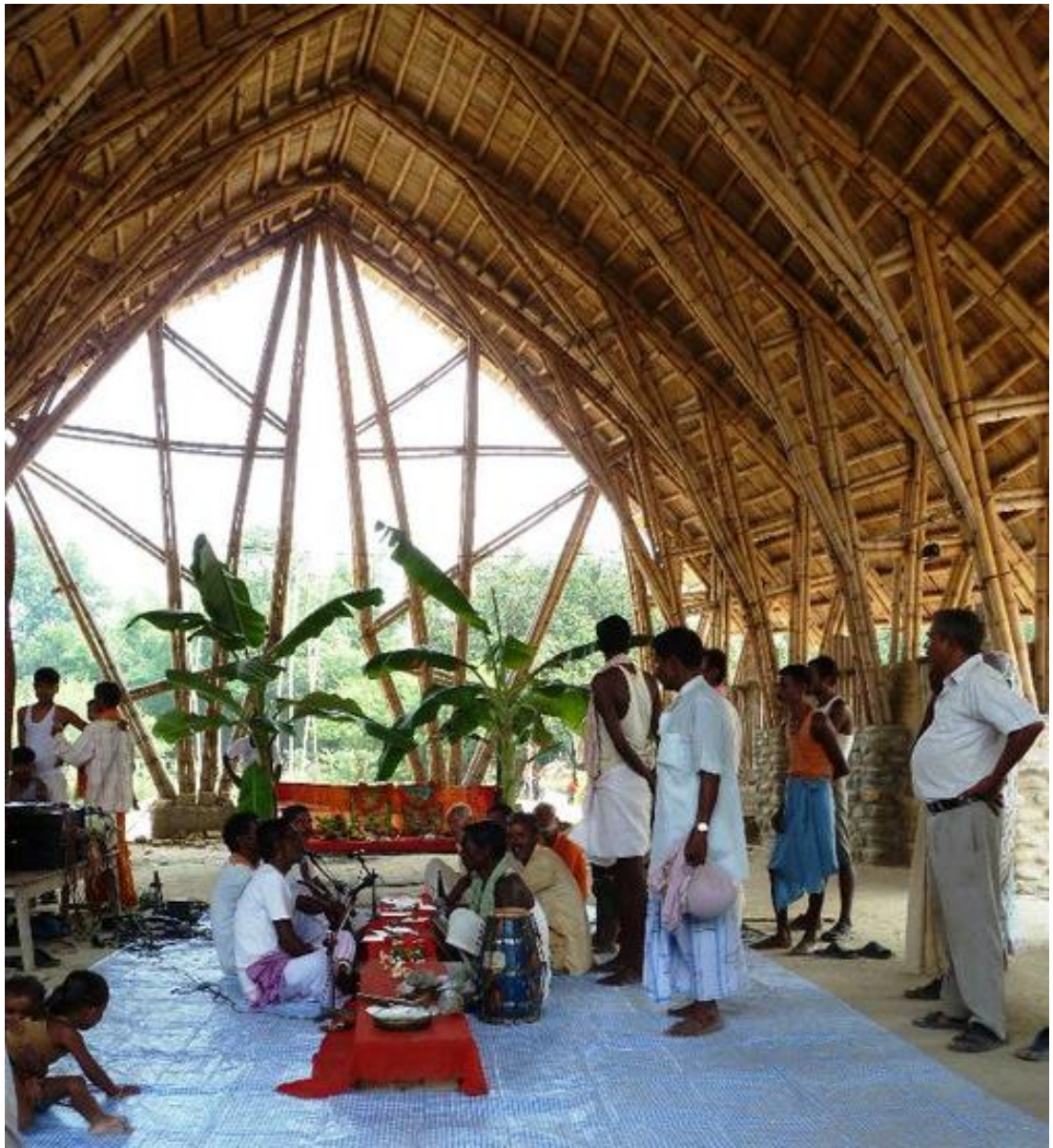
Fundamentals:

Simple Tools/training

Public participation/ treatment

Fundamentals:

Case Study: Janakpur, Nepal



- Large scale structures are up to 30 percent cheaper.
- Almost all the resources locally acquired.
- Can be built by local carpenters
- Gives self confidence and pride to villagers for using local resources.
- Changes local perception of the material.

Case Study 2: Post-Disaster Recovery

Sichuan,China

BENCHAM BENELUX CHAMBER OF COMMERCE

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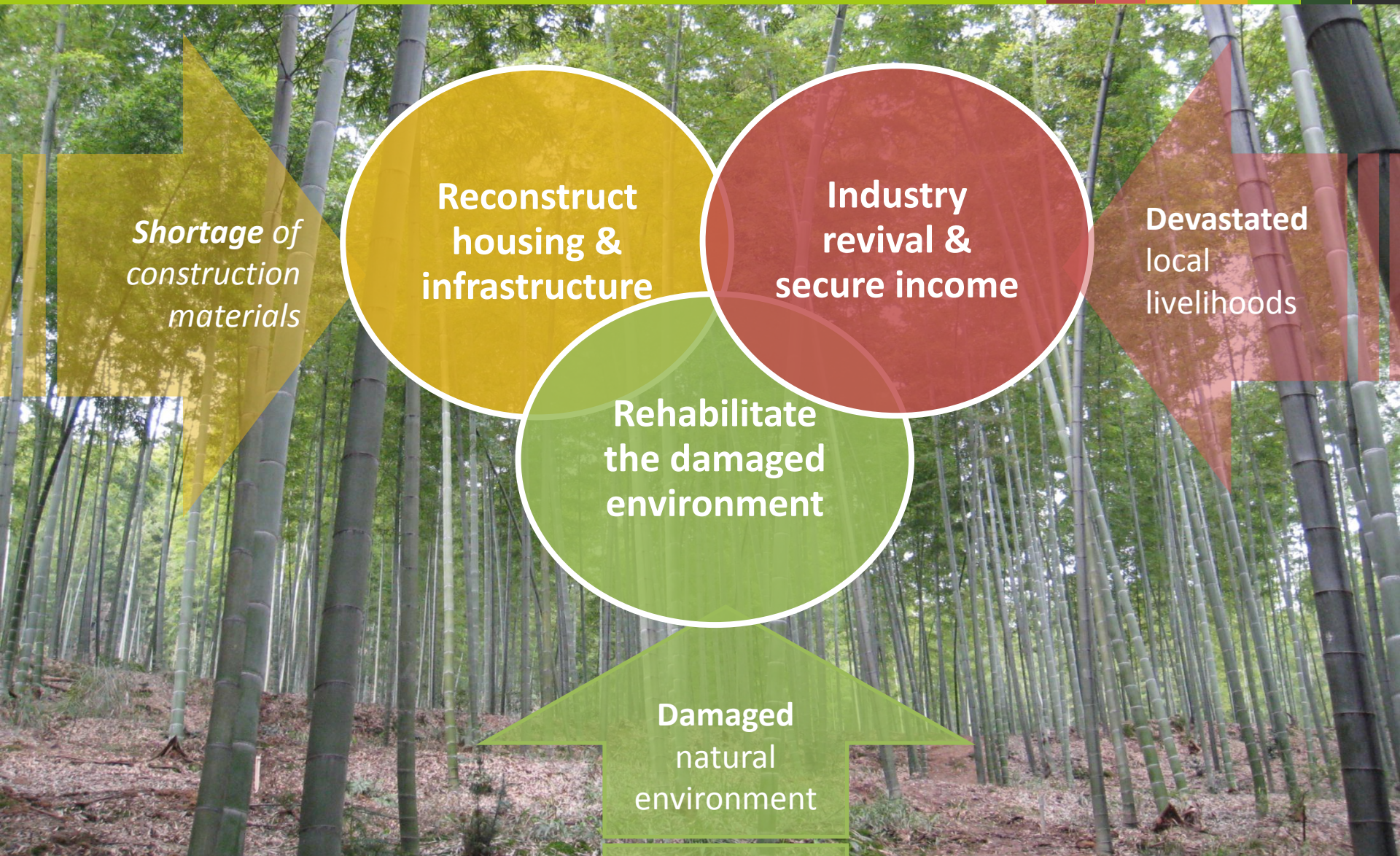
Background

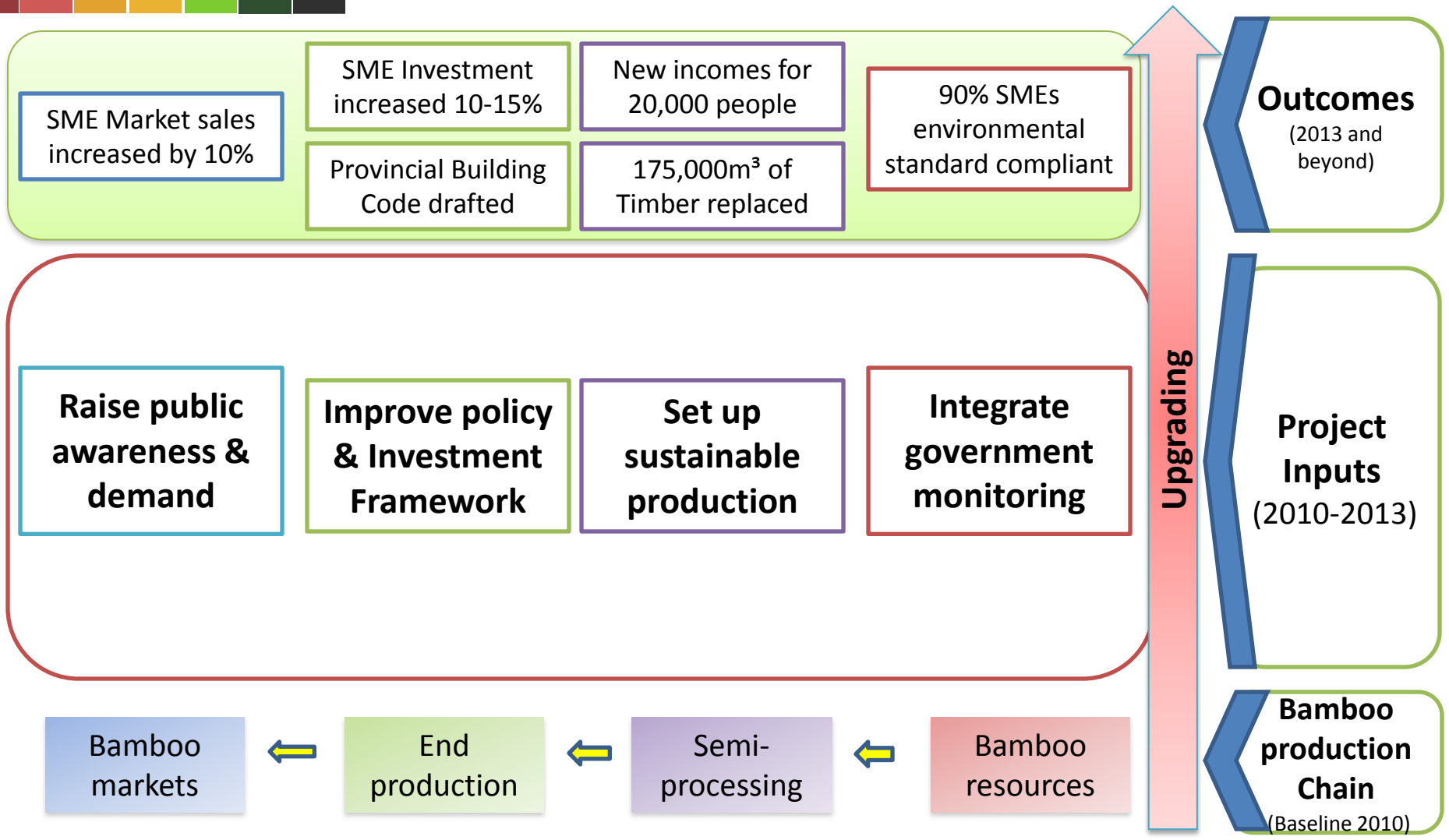
2008 Sichuan Province Earthquake

- 5.5 million people left homeless and displaced
- 370,000 unemployed & 1.15 million deprived of agricultural production
- €21 billion in damages - **huge demand for re-building materials**

Project Rationale



Bamboo Supply Chain For Recovery



Processing for Bamboo Plywood

Culm —1 sawing &striping→ Strip —2 splitting→ Sliver —3 weaving→ Curtain/Mat

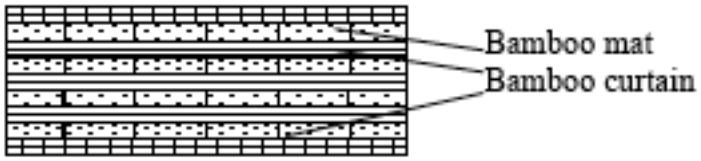
Curtain/Mat —4 drying→ Dried Curtain/Mat

Dried Curtain/Mat —5 impregnation→ Immersed

Immersed —6 drying→ Dried Curtain/Mat

Dried Curtain/Mat —7 forming→ mat

mat —8 hot pressing→ plybamboo/ laminated panel



Case Study 3: Adaptation to climate change, Ecuador

Components:

- Analyzing vulnerability to CC
- Strengthen local capacities
- Build CC adapted bamboo houses
- Policy development

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oportunidades para todos

DEVELOPMENT MARKETPLACE

Use of bamboo: Guayaquil, Ecuador

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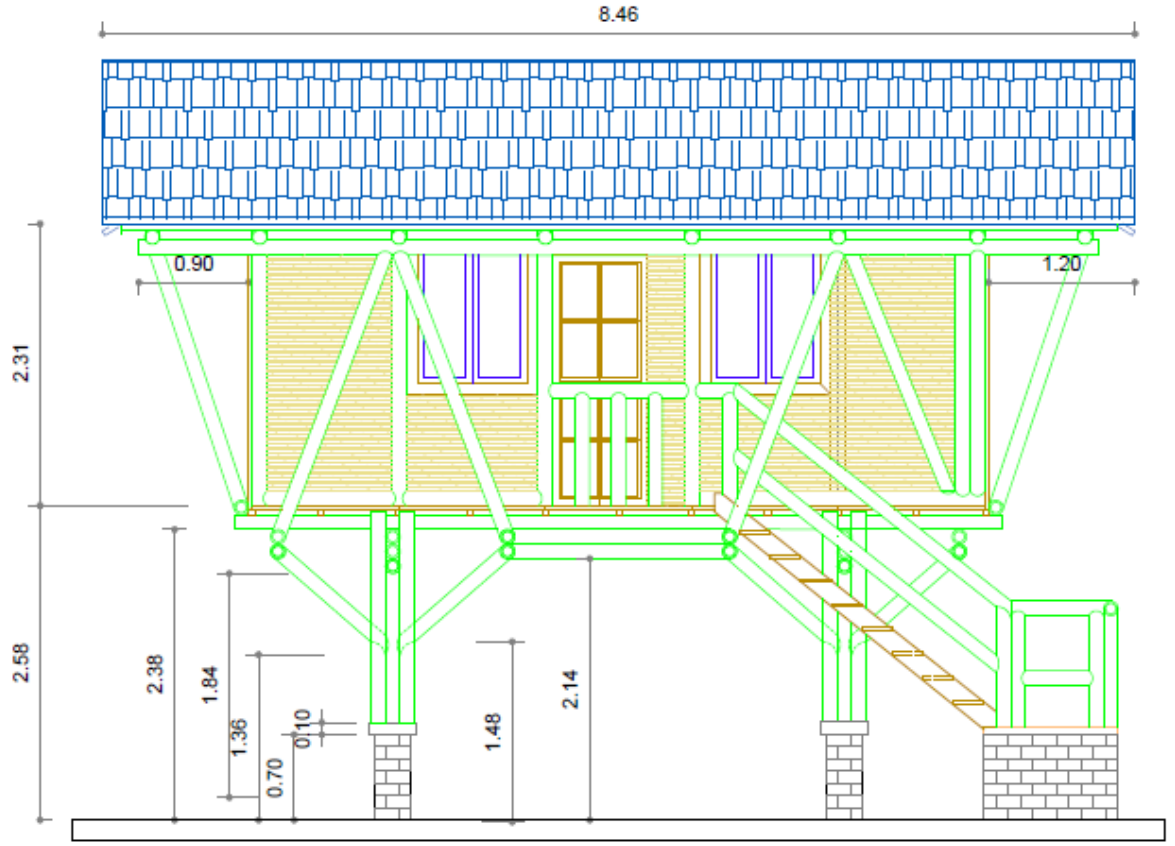

ELEVACION FRONTAL - CASAS ELEVADAS DE BAMBU

ESCALA ——— **1:50**

. JORGE MORAN / SAUL VERA --- AGOSTO - 2011

Elevated bamboo houses

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Better practices

Thank You!

Find out more at:

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