



INTERNATIONAL CONFERENCE ON SUSTAINABLE DEVELOPMENT OF NON
TIMBER PRODUCTS AND SERVICES

Potential Rural Communities Sustainable Development through Bamboo Forest Management and Utilization in Peru

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INTRODUCTION

SOUTH AMERICA : PERU

- Surface: 17'900,000 Km²
- Density: 18 hab/km²
- Amazon Rain Forest:
6'915,000 km²
- Surface Peru: 1.2 million km²
- Population Peru: 28,674,757
- Andean Mountain:
Huascarán 6,768 m



PERUBAMBÚ

ANDEAN RURAL COMMUNITIES

- 5,818 Andean Communities
- 7'000,000 Rural Population
- 711,580 Andean Native People
- +/- 50% Women
- Andean Communities Land: 2'026,481 hectares.
- Main activities: small scale agriculture, dairy farm and others.
- 2'000,00 million hectares available for forestation and reforestation.



AMAZONIAN RURAL COMMUNITIES

- 1,265 Native Communities
- 300,000 Native People
- 59 grupos/15 linguistic families
- 1'000,000 Rural Mestizos
- +/- 50% Women
- Native Communities Land: 10.5 million hectares tropical forest.
- Main activities: migratory agriculture, timber (mahagomi) and NTFP extraction (wildlife animals, nuts, bamboo, etc.).
- 10 million hectares available for reforestation.



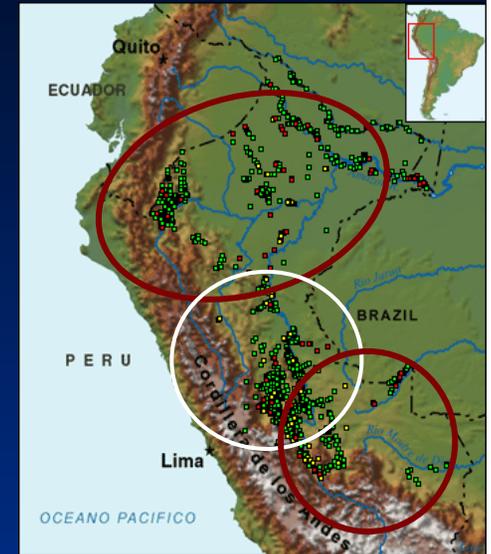
Comunidades Nativas de la Amazonía peruana



- : Inscritas y tituladas (940)
- : Inscritas o tituladas (55)
- : Ni inscritas ni tituladas (72)

Fuente: SICNA - IBC 2005

THE MAIN PROBLEM INCREASING TROPICAL FOREST DEFORESTATION



- Present
- Past

250,000 ha/year

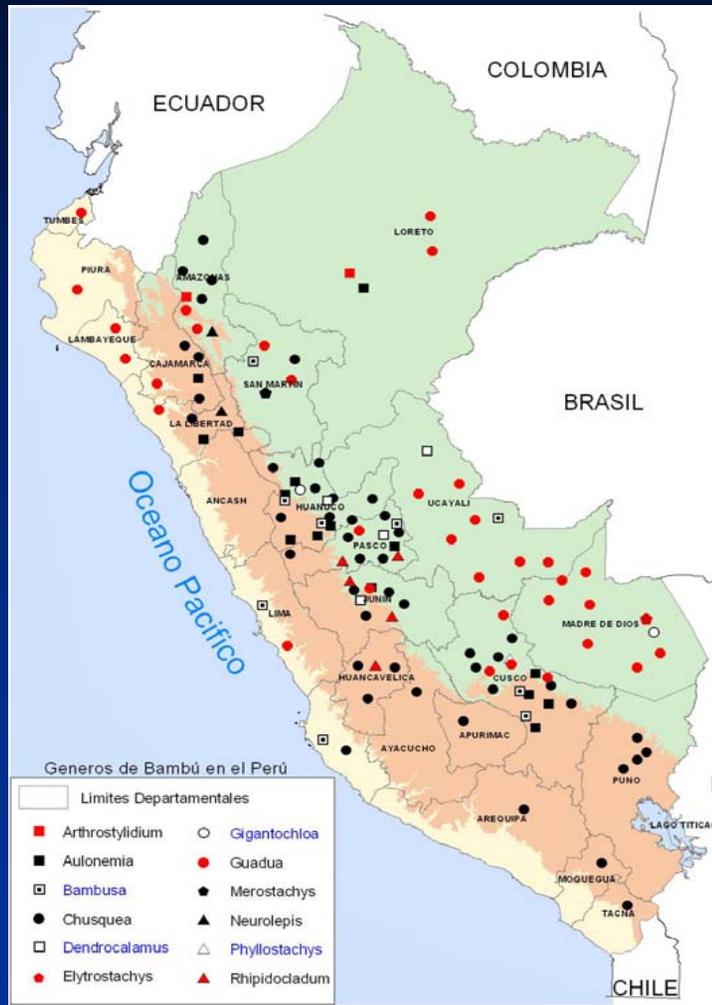
BAMBOO BIODIVERSITY



Latin America's countries with highest native bamboo diversity

Bamboo natural forest:
 Latin America: > 11 million ha
Peru: > 4 million ha

NATIVE BAMBOO SPECIES



Natives: 8 Genus and approx. 54 species

- Aulonemia sp 7
- Arthrostylidium sp 2
- Chusquea sp 22 - 29
- Elytostachys sp. 1
- Guadua sp 6
- Merostachys 1
- Neurolepis sp 2
- Rhipidocladum 2 - 4

Exotic: 4 Genus and 13 species.

- Bambusa sp. 8
- Dendrocalamus sp. 1
- Phyllostachys sp. 3
- Gigantocloa . 1

NOTE: Preliminary information.

An specific research project for bamboo species identification & characterization is going to start in 20

PREDOMINANT BAMBOO GENUS



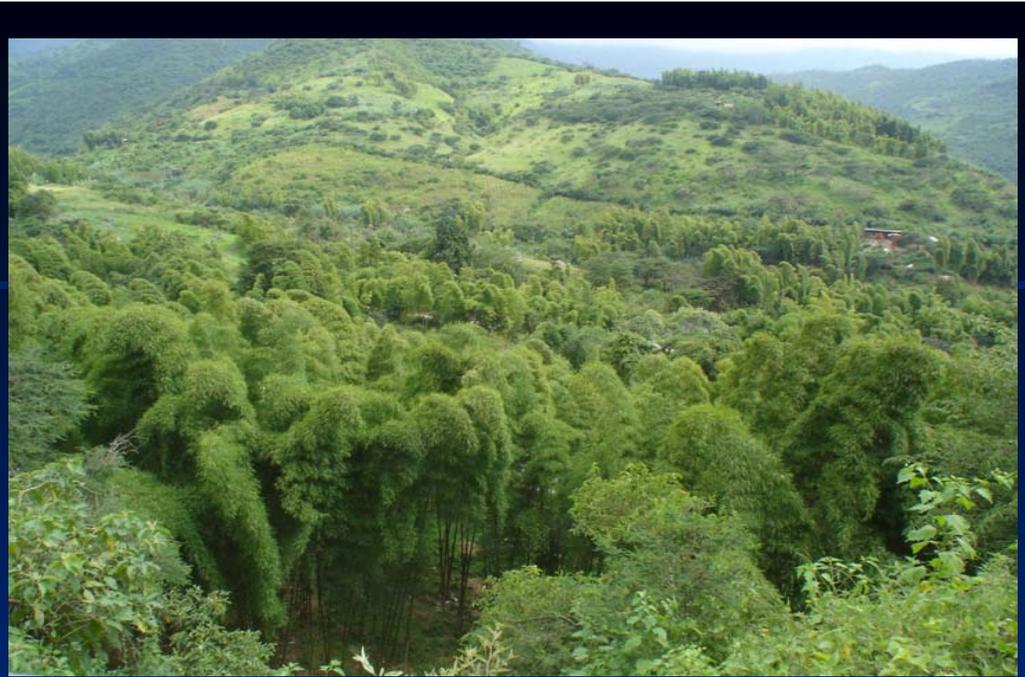
GUADUA



CHUSQUEA



ALOUNEMIA



Guadua angustifolia Kunt

High: 24-30 m

Diameter 0.15-0.25 m

Yield: 1,200 – 1,300 culms/ha

Density: 0.8 g/cm³

Tension: 15 kN/cm²

Flexion: 7.6 kN/cm²

Elasticity: 1.800 kN/cm²

Simón Eicher – Inst. Otto Graf (AI)

Dr. Jules Janssen – Eindhoven University (NL)

Arq. Oscar Hidalgo L. – Univ. Nac. of Colombia



PREDOMINANT SPECIES IN SOUTH EAST BAMBOO FOREST

- *Guadua weberbaueri*
- *Guadua sarcocarpa*
- *Guadua angustifolia*

Others:

1. *Guadua superba*
2. *Guadua paniculata*
3. *Guadua chacoensis*



G. paniculata



G. chacoensis

REGIONS	AREA	VOLUME
■ Junín	96,052.00	
■ Cusco	386,791.00	
■ Ucayali	1'903,535.00	
■ <u>Madre de Dios</u>	<u>1'611,422.00</u>	
TOTAL	3'997,800.00	152,000 M3

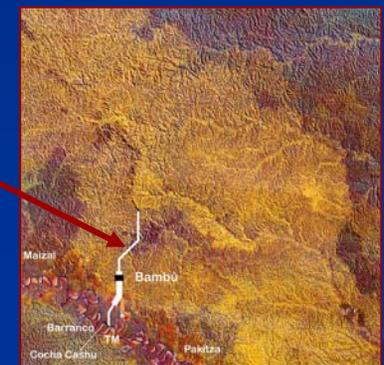
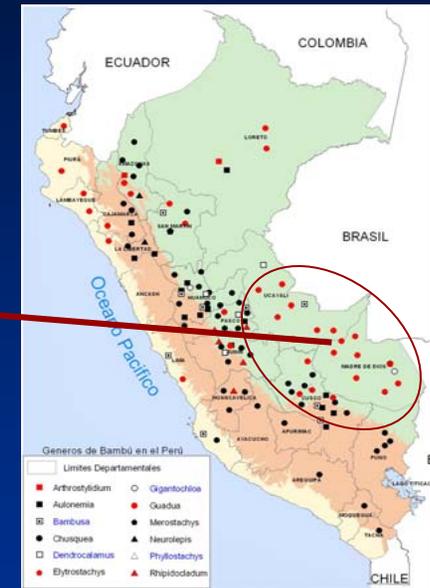
Density:

- 30% to 70%



G. superba

IMAGE OF THE SOUTH EAST BAMBOO FOREST





MAIN BAMBOO USES IN PERU PAST & PRESENT

PRE INCAS CULTURES: CARAL 5000 years BP



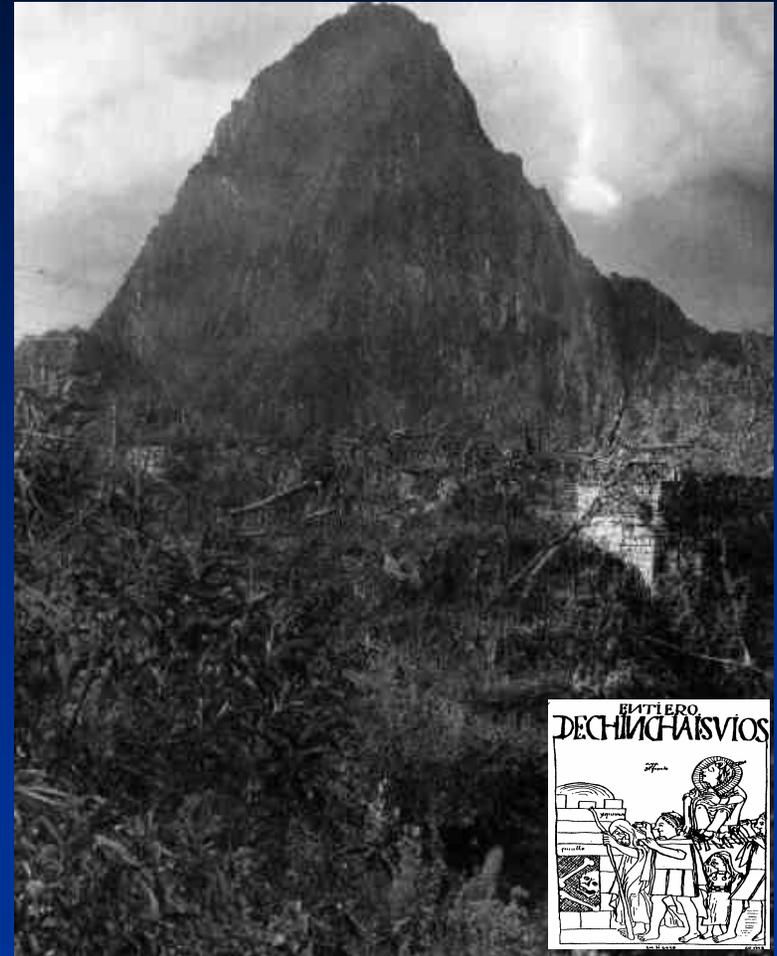
Bamboo canes & clay: quincha



PRE INCAS and INCA CULTURES



Real Tomb of Lord of Sipan: 2000 BC



Manchu Picchu ruins with a curtain of bamboo plants (H. Bingham 1911) 17

BAMBOO'S QUINCHA COLONIAL & EARLY REPUBLIC



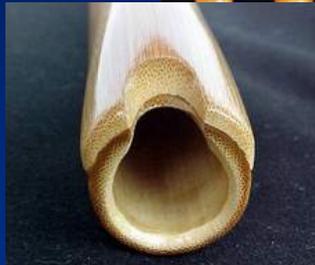
BAMBOO'S MODERN HOUSES



BAMBOO'S MINOR INFRASTRUCTURE



FURNITURE AND HANDYCRAFTS



BAMBOO POTENTIAL USES IN PERU

SUSTAINABLE BAMBOO USES FOR RURAL COMMUNITIES DEVELOPMENT

BAMBOO PRODUCTS MADE BY RURAL PEOPLE

- HANDYCRAFTS
- CHARCOAL
- FURNITURE & HOME ACCESSORIES

PRODUCTION OF BAMBOO FOR LARGE SCALE DIRECT USE & TRANSFORMATION

- CONSTRUCTION MATERIAL FOR HOUSING PROGRAMS, LODGES FOR ECOTURISM & RURAL PUBLIC INFRASTRUCTURE
- STANDS FOR AGRICULTURE
- BAMBOO FLOORING & BOARDS
- PAPER PULP & PAPER
- CELLULOSIC ETHANOL ?

BAMBOO FOREST ENVIRONMENTAL SERVICES

- SOIL & WATER MANAGEMENT
- BIODIVERSITY CONSERVATION
- ECOTURISM
- CARBON SINK & O₂ PRODUCTION

COMPARISON WITH OTHER MATERIALS FOR SEISMIC RESISTANT CONSTRUCTIONS

- Bamboo is 30 % cheaper than a traditional construction in concrete & steel.
- Less energy used for bamboo production. →
- Improves rural people economy: Income US\$ 9,000 to 10,000/Year/Ha from *Guadua angustifolia* plantation.
- Rural labour for production and construction (gender equal opportunities).
- Sustainable resource: perennial.
- Short term for productive yields: (5 years).
- Promotes reforestation and prevents deforestation.

Material	Unid	Cost
Bamboo	MJ / m ³ per N/mm ²	30
Timber	MJ / m ³ per N/mm ²	80
Concrete	MJ / m ³ per N/mm ²	240
Steel	MJ / m ³ per N/mm ²	1500

Prof. Jules Janssen, Eindhoven University (Holand)

IMPROVE AND INCREASE THE USE OF BAMBOO FOR HOME, AGRICULTURE & INDUSTRY



FURNITURE



STANDS

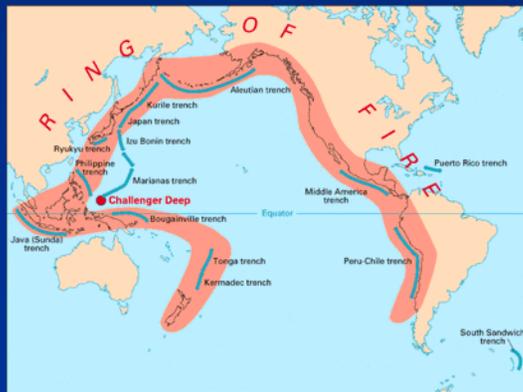


CHARCOAL



HANDYCRAFTS

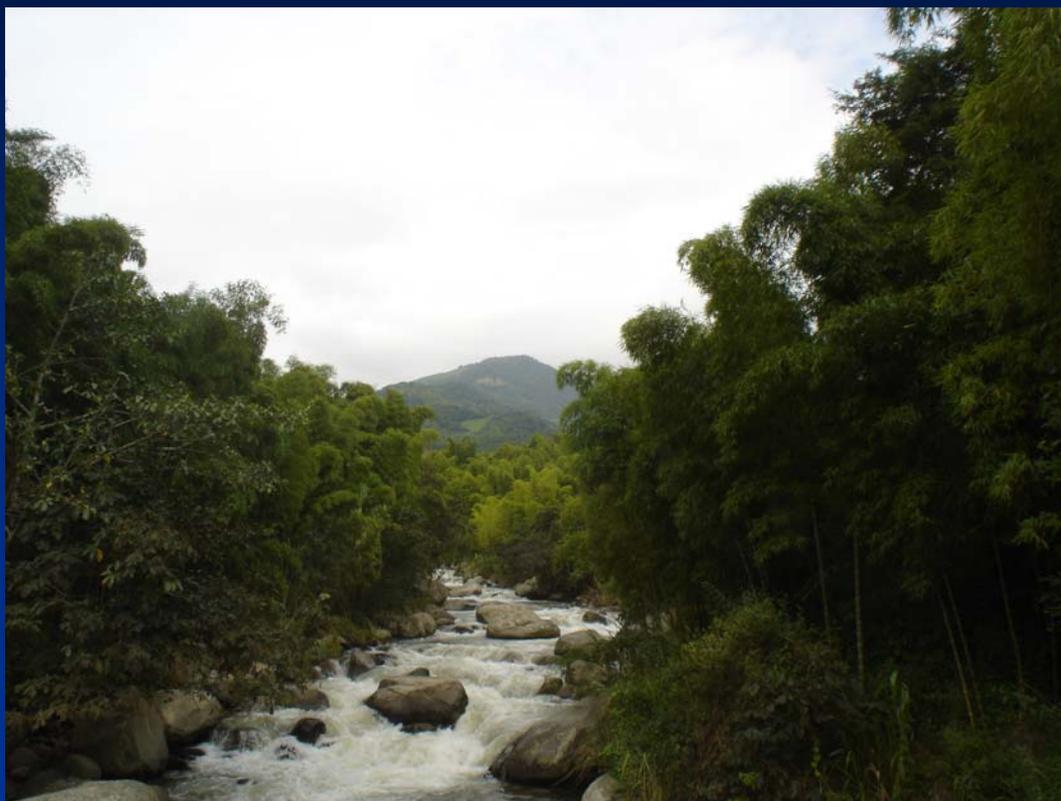
BAMBOO SEISMIC RESISTANT HOUSING PROGRAM



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ENVIRONMENTAL SERVICES

WATER & SOIL MANAGEMENT, CO2 SINK, WILDLIFE HABITAT, ECOTOURISM



1,856 Bird species
3-4% bamboo forest obligated habitat

RAW MATERIAL FOR INDUSTRIAL USES

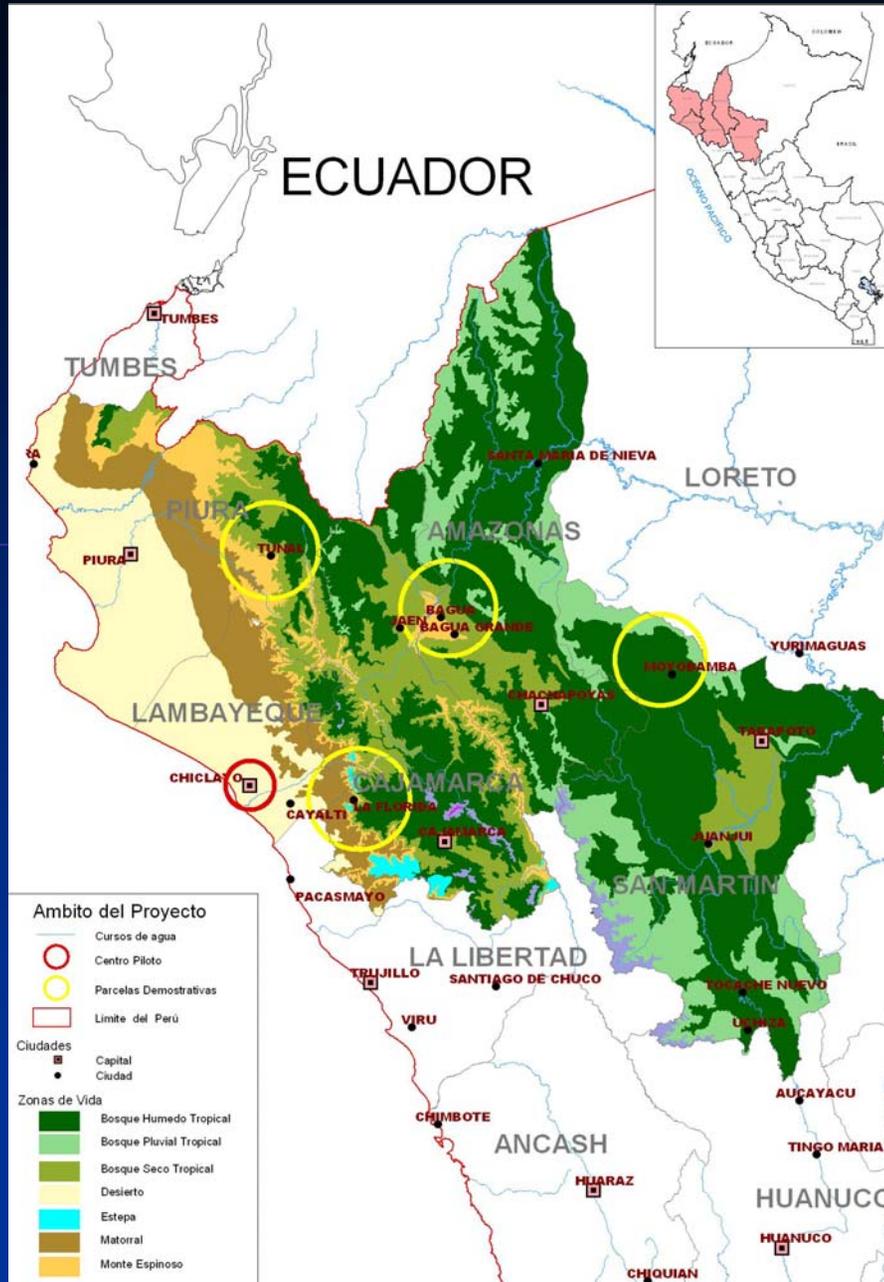


Some bamboo species have 40 to 60% more cellulose and less hemicellulose than most tropical timber, therefore produce more sugar/ha/year by microbial fermentation.

ITTO PROJECT FOR BAMBOO FOREST REHABILITATION, MANAGEMENT AND USE IN NORTHWEST PERU



PERUBAMBÚ



REHABILITATION, SUSTAINABLE MANAGEMENT AND USE OF TROPICAL BAMBOO FOREST IN THE NORTHWEST REGION OF PERU (PD 428/06 Rev.1(F))

- 04 Regions
- 10 Amazonian Native Communities
- 02 Andean Rural Communities
- Direct beneficiaries: 250 trained people
- Indirect beneficiaries: 1,500-2,000 people
- 100 hectares for management
- 200 hectares for rehabilitation
- Production of bamboo culms (sustainable managed bamboo forest)
- Transformation (treated material for construction, handy crafts & furniture)
- Environmental Services

Thank you

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