

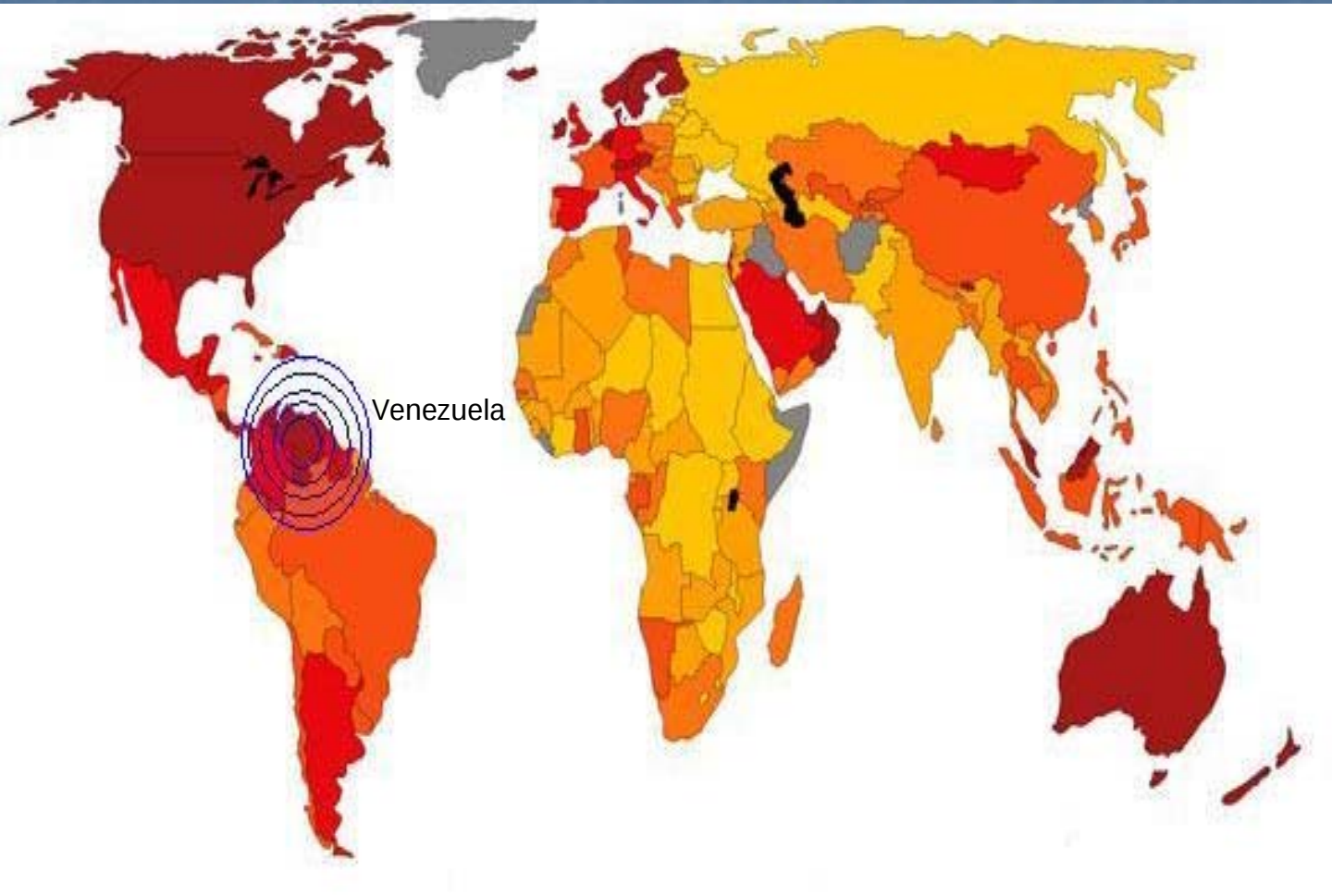
2007 Training Course on Bamboo Technology for Developing Countries

Venezuelan Country Report

C. B. R. C.

Eng. Mr.Sc. ASDRÚBAL OSTOS

VENEZUELA: AN GREEN TROPICAL COUNTRY





MINISTRY OF ENVIRONMENT AND THE NATURAL RESOURCES
DIRECTION OF ENVIRONMENTAL STATE IN BARINAS
Coordination of Environmental Conservation

INTRODUCTION TO GROWING, HANDLING AND USE OF THE GUADUA/BAMBOO

Guadua angustifolia Kunth

TAXONOMY OF THE GUADUA-BAMBOO

Guadua angustifolia Kunth

TAXONOMY: Science that describe, name and classify the alive organisms

Comun Name:

- Guadua
- Gauda
- Guadúa
- Caña guadua
- Guafa
- Guasdua,
- Juasdua,
- Caña de Guayaquil.



TAXONOMY CLASIFICATION OF THE GUADUA

Kingdon:..... Vegetal

Division: Spematophyta

Sub-division: Angiosperma

Class: Monocotiledoneas

Order:..... Glumiflorales

Family: Poaceae (Gramineae)

Sub-family:..... Bambusoideae

Tribe: Bambusseae

Sub-tribe: Guaduinae

Genus: *Guadua*

Species: *Angustifolia*

Varieties: Bicolor and nigra

Forms: “Macana”, “Cebolla”, “Cotuda” y “Castilla”

DISTRIBUTION

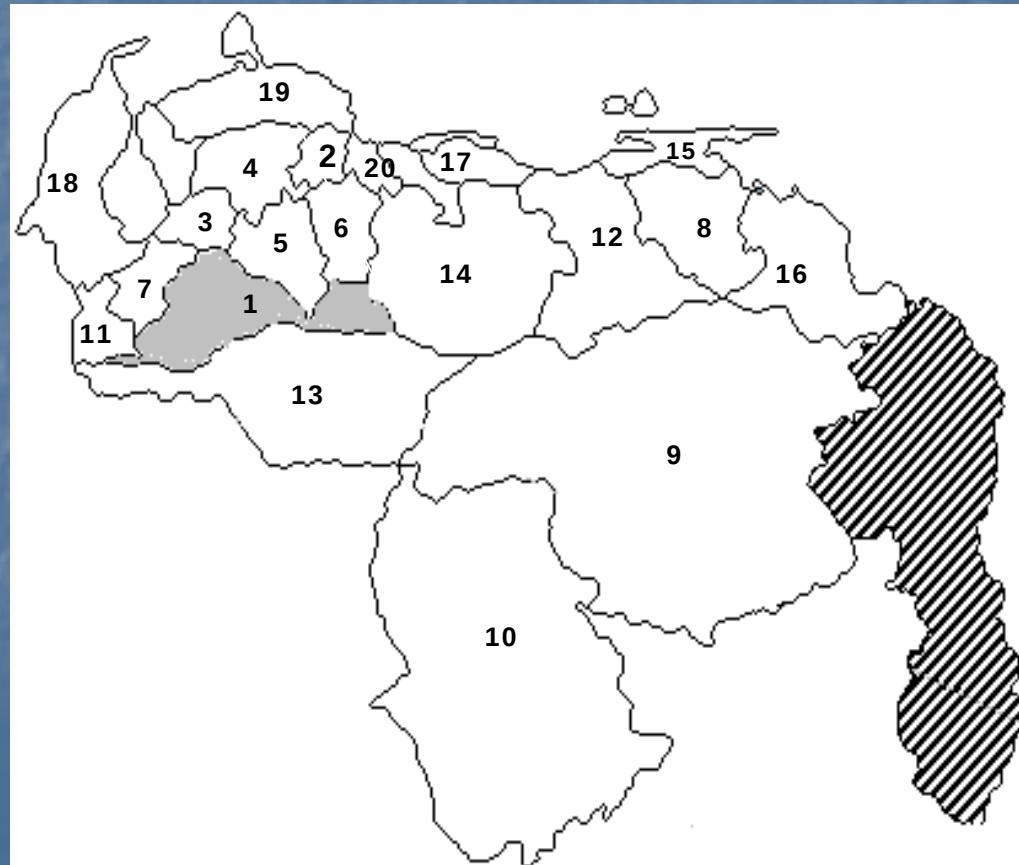
DISTRIBUTION	BAMBOO	GUADUA
GROWTH	In the tropicals regions and templadas de Asian, African and América	Tropical America
LATITUDINALMENT	From north of Japan (51°N) to North of Argentina (35°S)	From San Luis de Potosí – Mexico. (23°N) To Norte of Argentina (35°S)
ALTITUDINALMENT	From the sea level (0 m.s.n.m.) to 4.300 m.s.n.m	From the sea level (0 m.s.n.m.) to 2.000 m.s.n.m

DISTRIBUTION OF THE GUADUA-BAMBOO IN VENEZUELA

- Grow as a kind of spontaneous spots on the banks of the large rivers and small ones.

MAIN STATES:

01 Barinas	07 Mérida
02 Yaracuy	08 Monagas
03 Trujillo	09 Bolívar
04 Lara	10 Amazonas
05 Portuguesa	11 Táchira
06 Cojedes	12 Anzoategui
13-20 Others potential states.	



WHERE TO GROW THE GUADUA

Main Areas

	Precipitation (mm)	Altitude (msnm)
Very humid tropical forest	4.000 – 8.000	0 – 1.000
Dry tropical Forest	1.000 – 2.000	0 - 1000
Very Humid sub-tropical forest	2.000 – 4.000	800 – 2.000
Very humid low hill	2.000 – 4.000	1.800 – 3.000

CLIMATIC FACTORS

FACTOR	GENERAL RANGE	OPTIMAL RANGE
Altitude (msnm)	0 – 2.600	600 - 2000
Temperature (°C)	14 - 26	20 - 26
Precipitation (mm/year)	950 – 5.000	1.800 – 2.500
Photo-period (hours-luz/year)	1.400 – 2.200	1.800 – 2.000
Relative Humidity	75 - 85	75 - 85
Winds (direction, intensity)	Weak or strong breezes	Weak or moderate breezes

EDAFIC FACTORS

FACTOR	DESIRABLE CHARACTERISTICS
Soil type	Volcanics ash to alluvials
Texture	Francs (F), Loams (L), Franc Loams (FL), Franc sands (FAR), Sand-loams (ArL), Franc clays (FA)
Structure	Granular to Blockos
Ph	5,5 – 6,5
Efective deep	1,0 - 1,5 (Moderade to tall)
Permeability	Moderade to tall
Humidity retention	Moderade to tall
Drynage	Good
Fertility	Moderade to tall. Por deficiencias de n – p – k o microelementos fertilizar el suelo.
Burned plants	No allowed
Pasturing	No allowed
Relief	It's possible in flat land and hills

MORFOLOGIC CHARACTERISTICS OF THE *Guadua angustifolia*

- **RHIZOME:**
Paquimorph with
enlonged neck.



MORFOLOGIC CHARACTERISTICS OF THE *Guadua angustifolia*

CULM:

- Hight: 15 a 30 mts
- Diametre: 9 a 22 cms
- Habite: Erect
- Branches with thorns
- Internudes (20-45 cm long.)
- Nodal rings with white piles.



MORFOLOGIC CHARACTERISTICS OF THE *Guadua angustifolia*

LATERAL BRANCHES (Riendas):

- One (1) dominant branch and 1 to 3 secondary branches.
- The dominant primary thorn basal, 3 to 5 mts long, have 2 to 5 thorn each node.

MORFOLOGIC CHARACTERISTICS OF THE *Guadua angustifolia*

CAULIANER LEAF:

- Coriacea.
- Triangular form with sheath and continuous sheet.
- Rugged sheath in the back covert with irritable piles.
- Bright sheath in the sheaf, without piles.

SOILS CONSERVATION

ENVIRONMENT SERVICES OF THE *Guadua angustifolia*

EROSION CONTROL:

- In the 20 to 25 cm. conforms a rhizoma net that keep the soil structure.
- Good disposition to occupy disturbed areas.



ENVIRONMENT SERVICES OF THE *Guadua angustifolia*

DEGRADED LANDS RECUPERATION :

- Biomass disposition
- To give fresh air and solar rays protection to the land surface.

ENVIRONMENT SERVICES OF THE *Guadua angustifolia*

BIODIVERSITY:

Asociated to the guaduales spot has been reported and close to the coffee areas:

- More than 120 plant species
- More than 48 species of birds
- 20 mammal species
- 7 species of reptils
- 122 insects species.

ENVIRONMENT SERVICES OF THE *Guadua angustifolia*

CARBON DIOXIDE FIXATION (CO₂):

- Fixes 9 tons of CO₂/year
- Permits to include in the Internacional Sistem of Commerce of Emission Rights.

ENVIRONMENT SERVICES OF THE *Guadua angustifolia*

WATER REGULATION:

- Extract, keep and store up 15 lts per culm (44.625 Lts/Ha).
- The store water is liberated in dry seasons.
- The associated vegetation, the biomass of dried leaves protects the soil reducing evaporation and transpiration, improving water store capacity.

ECONOMIC VALUE OF THE *Guadua angustifolia*

Short time of use

- Fast growing: 21 cm./day
30 mt high in six (6) months.
- Fisiological maturity: 3 a 6 years

ECONOMIC VALUE OF THE *Guadua angustifolia*

High production Volumen/Hectare

- Produces among 1.000 a 1.400 comercial culms by ha/year.
- 100 to 140 m³ of raw wood.

ECONOMIC VALUE OF THE ***Guadua angustifolia***

Renovable and Sustainable Resource in the Time.

ECONOMIC VALUE OF THE *Guadua angustifolia*

Diversity of Use:

More than 1500 uses well-known

AGRICULTURE AND LIVESTOCK INFRAESTRUCTURE



CONSTRUCTIONS



CONSTRUCTIONS



FURNITURES



FURNITURES



HANDICRAFTS



HANDICRAFTS



PROJECT OF BAMBOO VENEZUELA - CHINA

Main Objective:

To develop a cooperation program with Hunan Province initiated in 2006, in order to give:

- Bamboo:
 - Technical assistance
 - Cultivation
 - Processing
 - Sustainable management.
- Rural communities:
 - Training for craftsmen
 - Application of technology
 - Better livelihood
 - Cultural recovering
 - Ethnical reinforcement.

Other objectives, to promote:

- Formation of forest technicians.
- Community empowerment in bamboo.
- Growth, use and transformation.
- Income generating.
- Craft and cultivation training.
- House construction Training.

Goals of the project:

- Training in bamboo growing, transformation and use.
- Nine (9) communities will be reached.

■ Phase I

■ GOALS:

- 1.1.- Training in bamboo growing, transformation and utilization.
- 1.2.- Nine(9) rural communities will be reached and attended.
- 1.3.- Several technicians from Agriculture Minister will be trained.
-

ASPECTS:

- 2.1.- Two specialist from China in reproduction, transformation and sustainable utilization of Bamboo will arrive to Venezuela for a six (6) month period.
- 2.2.- One specialist in crafts and industry.
- 2.3.- One translator.

Phase II

GOALS.

- 2.1.- Create the National Bamboo Production Center in Merida State to develop (5) Five Programs:
 - 2.1.1. Evaluation and Behavior of Bamboo.
 - 2.1.2. Nursery Management.
 - 2.1.3. Management of Bamboo productive plantations.
 - 2.1.4. Establishment of Entropic Plantations
 - 2.1.5. Create workshops for crafts and industry.

Phase II

■ FRAME:

With this Cooperation Agreement between Popular Republic of China and Bolivarian Republic Venezuelan:

- Venezuela conforms a group of technicians.
- New programs can be developed.
- New machinery and equipment can be located in the country.

Participants:

1. China Ministry of Foreign Relation
2. Culture Ministry
3. Art Institute
4. Agriculture and Land Ministry
5. Merida State Authorities
6. National Research Institute.

■ MAIN FOCUS OF PROJECT:

Training and conformation of a group of Venezuelan technicians in order to do the know-how Technology Transfer of Bamboo.

In our time we must live and work in such way that something we receive as seed, we can give to the next generation as a flower and that one we already received flowering we can give as a fruit.

This is progress..

THANKS TO ALL MY FRIENDS...