

CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES
OF WILD FAUNA AND FLORA

First meeting of the Mahogany Working Group
Santa Cruz de la Sierra (Bolivia), 3-5 October 2001

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1. Document prepared by the Management Authority of Venezuela.

***THE REPUBLIC OF VENEZUELA
MINISTERIO DEL AMBIENTE Y DE LOS RECURSOS NATURALES
DIRECCION GENERAL DEL RECURSO FORESTAL***

MEETING OF THE MAHOGANY WORKING GROUP

Santa Cruz, Bolivia 3-5 October 2001

***CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES OF
WILD FAUNA AND FLORA (CITES)***

Caracas, May 2001

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CITES Management Authority Flora/Forest Species

I. INTRODUCTION

The forest is the most abundant and variable element in nature. It covers a large portion of the surface of the Earth, is indispensable to the existence of man and meets a broad range of social, environmental, cultural, spiritual and economic needs. The tropical forest ecosystem is recognized as one of the most basic elements for maintenance of the planet's ecological equilibrium. It produces and maintains the largest amount of animal and plant biomass per unit of area and contains the highest biological diversity. As a result, the forest is the most important reservoir of genes in the world.

From the economic point of view, one of the most important tree species in the tropical forests is mahogany (*Swietenia macrophylla*), primarily because of its physical and mechanical properties, which have led to its heavy exploitation and use to meet the demand of the forest industry. As a result, steps should be taken to guarantee, develop and promote its existence in that ecosystem. It is for this reason that the Venezuelan Ministerio del Ambiente y de los Recursos Naturales (MARN) through the Dirección General del Recurso Forestal and the CITES Management Authority for Flora/Forest species has prepared this background document for the meeting of the Mahogany Working Group of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) to be held in Santa Cruz, Bolivia, from 3 to 5 October 2001. This document seeks to evaluate the soundness of the basis for listing this species in Appendix III of the CITES Convention.

II. BACKGROUND

Two of the three species of the genus *Swietenia*, *S. humilis* and *S. mahagoni*, are listed in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Since the eighth meeting of the Conference of the Parties to CITES (CoP8), in Kyoto, Japan, in 1992, the species *S. macrophylla* has been the object of repeated proposals for listing in Appendix II, by the contracting Parties. The main principles of the Appendices are:

APPENDIX I: Shall include all species threatened with extinction which are or may be affected by trade. Trade in specimens of these species must be subject to particularly strict regulation in order not to endanger further their survival and must only be authorized in exceptional circumstances.

APPENDIX II: Shall include:

- a) all species which although not necessarily now threatened with extinction may become so unless trade in specimens of such species is subject to strict regulation in order to avoid utilization incompatible with their survival; and
- b) other species which must be subject to regulation in order that trade in specimens of certain species referred to in sub-paragraph (a) of this paragraph may be brought under effective control.

APPENDIX III: Shall include all species which any Party identifies as being subject to regulation within its jurisdiction for the purpose of preventing or restricting exploitation, and as needing the cooperation of other Parties in the control of trade.

The following is a brief description of the discussion of mahogany in the meetings of the Conference of the Parties during the period 1992–2000.

Eighth meeting, Kyoto, Japan, 1992

A proposal for listing was made by the United States of America and Costa Rica, with Bolivia as the main opponent of that proposal. The countries in the area of distribution, specifically Panama, announced their opposition because the countries making the proposals did not consult them. The proposal was withdrawn by the United States following heated debate among the Parties, and Bolivia agreed to present technical studies that would confirm the status of its populations.

Ninth meeting, Fort Lauderdale, United States, 1994

A proposal for listing was made by the Netherlands, with Brazil as the main opponent to that proposal. After a secret ballot, the proposal was rejected, because it did not obtain two thirds of the votes required for approval.

Tenth meeting, Harare, Zimbabwe, 1997

A proposal for listing was made by the United States and Bolivia and was rejected for the same reasons as at the previous meeting, with Brazil agreeing to establish internal protection measures for the species and to study its status in the region. An informal Mahogany Working Group was created.

Eleventh meeting, Nairobi, Kenya, 2000

The Conference of the Parties adopted by consensus document Com. 11.8 officially creating the Mahogany Working Group, in order to facilitate consultations. The United States agreed to sponsor the activities of that group.

Currently, Bolivia, Brazil and Costa Rica have listed mahogany in CITES Appendix III. Venezuela has not joined in listing this species because of a lack of specific internal legislation for that species that would support the listing.

Listing of a species in Appendix III does not require a vote of the Parties, only a request to the CITES Secretariat by a Contracting Party. Resolution Conf. 9.25 recommends that when requesting inclusion of a species in Appendix III a Party ensure that that species is native to that country and that national regulations are adequate to prevent or restrict exploitation and control trade.

Several activities in relation to the species *S. macrophylla*, have been carried out at the regional level:

- First meeting of the Mahogany Working Group, convened by Brazil, with the approval of the Tratado de Cooperación Amazónica (TCA), at Brasilia from 2 to 5 June 1998. Among the issues discussed were a survey of mahogany in Brazil, recent legal and administrative issues, legal aspects of forestry in Bolivia, the inexistence of species of Meliaceae in Ecuador and Surinam, forest administration in Peru, experience in sustainable forest management in Venezuela and implications of the regulation of trade by international agencies.
- Ninth meeting of the FAO Panel of Experts on Genetic Forest Resources, 1995. A network for cooperation on the genetic resources of species of Meliaceae in the Neotropics was proposed.
- Preparatory regional meeting for the 11th meeting of the Conference of the Parties to CITES, held in Quito, Ecuador, in 2000, with a proposal by Brazil that protection

mechanisms for this species be established. It was stated that this proposal would again be submitted to the Conference of the Parties.

III. STATUS OF TRADE IN *SWITENIA MACROPHYLLA*

A report by TRAFFIC Network, presented in 1997, less than two years after the entry into force of Appendix III for *S. macrophylla*, provided the following important information:

1. Several Parties to CITES involved in trade in this species, Bolivia, Brazil, Peru, the United Kingdom and the United States of America, have taken steps to implement the listing of *S. macrophylla* in Appendix III. The first three, all exporting countries, requested that CITES certificates of origin be issued before export certificates, pointing out that the requirement of that certificate had not interfered with other regulation of trade and did not represent additional work for government agencies or for exporters.
2. Several other countries in the area of distribution, Belize, Mexico and Nicaragua, began application of the requirements of Appendix III.
3. In the case of Venezuela, it was reported that the Government had "...decided to permit the use of Customs documents as CITES certificates of origin..." The same situation occurred in Guatemala, which held that requesting information on these documents would comply with the CITES requirements. In this regard, the Venezuelan CITES Management Authority for Flora/Forest species clarified the situation and now uses the CITES certificates of origin.
4. The Government of the United Kingdom began in November 1995 to request the issue of import permits for *S. macrophylla*, requiring that CITES certificates of origin be presented at the time of importation.
5. The Government of the United States verifies that imports of *S. macrophylla* are accompanied by CITES certificates of origin. It seems, nonetheless, that several shipments were accepted based solely on Customs documents.
6. Argentina, Brazil and Peru did not request presentation of CITES certificates of origin for imports of *S. macrophylla*, although there are indications that this species was imported by the three countries.

The report also mentions that implementation of CITES Appendix III seems to have been effective with respect to trade between the key producers and consumer countries, but any failure to implement CITES import controls for *S. macrophylla* would decrease the effectiveness of Appendix III and that the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) did not specify the information that should be included on the CITES certificates of origin and did not indicate the authority required for issuing or their period of validity. The report claims that the Parties are free to determine the format of these certificates and the Government agencies designated to issue them. **Nonetheless, the Conference of the Parties to CITES decided in Resolution Conf. 9.3 that only Management Authorities should be authorized to issue these documents.**

In this respect, the document presented by the CITES working group on timber-yielding species recommended:

1. Provision of a minimum of specific information on the CITES certificates of origin, including the CITES name and logo, the scientific name of the species, the type and quantity of the product traded and the country of importation.

2. That the period of validity of the certificates be fixed at 12 months. It was pointed out that although *S. macrophylla* was one of the few timber-yielding species traded in large volume, Customs services and other agencies responsible for monitoring imports of timber seemed to be unfamiliar with the CITES requirements.

The following problems were detected in trade in this species:

1. The units of measurements used to document the timber are not uniform.
2. Whether there is a need to include all natural populations of a species in Appendix III in order to help countries to apply trade controls.

The TRAFFIC Network report recommended:

1. Taking steps to implement Appendix III.
2. Enforcement of the prohibition of unauthorized imports.
3. Application of the recommendation of Resolution Conf. 9.3.
4. Provision to the CITES Secretariat of a standard format for circulation to the Parties.
5. Assurance that inspection personnel are notified of CITES requirements.
6. Adoption of standard measures to document the volume of timber traded..

IV. FORESTED AREA

According to the Atlas Forestal de Venezuela (MAC, 1961), slightly more than half of Venezuela is covered with some type of forest vegetation. Given the current accelerated rate of deforestation, the Government has provided for the creation of Special Administrative Areas (ABRAES) for the protection and conservation of forests. Currently, Venezuela has about 10 forest reserves with a total of 12 million hectares and 17 national parks that add approximately 2.5 million hectares of permanent forest. In addition, a good number of smaller areas have been declared natural monuments, wildlife reserves or related protected areas.

As is the case for most of the tropical forest, the forests in Venezuela are formed by a wide diversity of botanical species with sometimes more than 40 species of trees in a single hectare. In areas already being exploited, more than 2,000 species of trees have been identified, nonetheless, only a small portion are of economic interest for the Venezuelan forest industry.

V. CHARACTERISTICS OF *SWITENIA MACROPHYLLA*

The genus *Swietenia* was established by Nikolaus Joseph Jacquin in 1760 in honour of the famous naturalist Baron Gerard I. B. Swieten. It is in the family of Meliaceae and has three universally recognized species: *S. mahagoni* (L) Jacq., *S. macrophylla* King and *S. humilis* Zucc. *Swietenia macrophylla* is known by its common names in Cuba as *caoba de Honduras* and *caoba centroamericana*; in Puerto Rico as *caoba hondureña*, *caoba de Honduras* and Honduras mahogany; in the Virgin Islands as Central American mahogany; in Mexico as *caoba*, *chiculte*, *cóbano*, *venadillo*, *zopilote*, *gateado* and *rosadillo*; in Nicaragua and Honduras as *caoba*; in Guatemala as *chacalte*; in Venezuela as *caoba*, *oruro* and *orura*; in Peru as *aguano*; in Colombia as *caoba americana*; in Bolivia as *mara*; in Brazil as *mogno*; in Guadalupe and Martinique as *acajou du Honduras* and mahogany Honduras; in French Guiana as *acajou d'Amérique*; and in the United States as Honduras mahogany and British Honduras mahogany. The timber of *Swietenia* is known in Spanish as *caoba*; in English as mahogany; in French as *acajou*; in Italian

as *mogano* and *acagiú*; in Portuguese as *mogno*, *acaju* and *anacardo da América*; in Dutch as *mahok*; and in German as *Mahagoniholz*, *Acajouholz* and *echtes Mahagoni* (Betancour, 1987).

Geographic distribution: *S. macrophylla* is the species in the genus that has the broadest area of distribution, from 20° North latitude in Mexico to 18° South latitude in Bolivia. It is found in the forests of Mexico, Central America, Venezuela, Colombia, Peru, Ecuador (only in a small area bordering Peru), Brazil and Bolivia (Lamprecht, 1989). In Venezuela, according to studies (Veillón, 1994), *S. macrophylla* is found in the dry tropical forest (Leslie Holdrige) or the trophophyte, Summer or macrothermic transition forest (Henri Pittier) or trophophyte macrothermic formation (Francisco Tamayo), specifically north of the Orinoco River in the llanos and north-western Venezuela that includes the states of Anzoátegui, Apure, Barinas, Carabobo, Cojedes, Falcón, Guárico, Monagas, Portuguesa, Sucre, Trujillo, Yaracuy and Zulia (see illustration 1). In 1972, according to figure 1, exploitation of this species was reported primarily in the states of Portuguesa with 12,950 cubic metres, Barinas with 4,734 cubic metres, Cojedes with 2,696 cubic metres, Falcón with 1,141 cubic metres and Miranda with 1,309 cubic metres. It grows best in the gallery forests of the western Llanos, from the state of Cojedes up to Barinas. It is found in smaller numbers in rain forest and virgin forest, where it forms small areas that stand out from the rest of the vegetation (Hoyos, 1974).

Morphology: The mahogany tree grows to between 20 and 50 metres in height. It has a broad crown, strong branches and thick foliage, with a trunk 20 to 125 centimetres in diameter, which can exceptionally reach 2 metres, and slightly streaked brownish-grey bark. Older trees have a buttressed base. The leaves are alternate, mostly pedicellate and paripinnate, from 25 to 45 centimetres long with 8 to 12 asymmetrical, opposite or sub-opposite rough leaflets, pointed at the apex and rounded at the base, from 10 to 13 centimetres long. Yellowish green flowers, in clusters in axial panicles from 10 to 25 centimetres long. Fruit is present in erect woody capsules, 12 to 16 centimetres long and 8 to 10 centimetres in diameter, pyriform with the widest part inserted in the stalk (Hoyos, 1974). Illustration 2 shows some of the outstanding phenological characteristics of this species.

Scientific name: *Switenia macrophylla* G. king.

Family: Meliaceae

Main uses: Fine woodworking, luxury furniture, interior decoration, lath work, sculpture, carvings and high-quality veneer.

Physical properties: Density (12 per cent CH) 480 kg/m³. Basic specific weight 430 kg/m³ (average). Radial, tangential and volumetric contraction of 3.1 per cent, 4.6 per cent and 8.7 per cent, respectively. Total porosity of 60 per cent. Saturation point of the fibres is 29 per cent.

Mechanical properties: Static flexibility (12 per cent CH), 860 kg/m². Compression parallel to the grain, 430 kg/cm². Lateral hardness, 471 kg.

Machinability and finish: Easily machined and worked with an excellent finish. Medium dull effect.

Storage and drying: Moderate rate of drying outdoors, kiln dries well; very durable and water resistant.

VI. SUPPLY OF RAW MATERIAL

The use or exploitation of forest products on private land and on land in the public domain managed by the federal Government, the states or municipalities cannot take place without prior fulfilment of the provisions of the Ley Forestal de Suelos and de Aguas and its regulations through contracts, concessions, annual permits or ministerial decision.

In Venezuela, slightly more than 80 native forest species are exploited annually. Figure 2 lists 16 species that contribute to 58 per cent of the total production and of which the species *saman*, *saqui-saqui* and *mureillo* represented 39 per cent of the national production of logs in 1999. The remaining species represent a production of less than 1 per cent, including mahogany, which now represents 0.5 per cent. It is clear that production continues concentrated in a small number of species, a situation that carries the risk of imminent extinction of other forest species.

VII. STATISTICAL ANALYSIS

According to figure 3, statistics show that exploitation of high-quality species (cedar and mahogany) began in 1938. From then until 1962, its exploitation gradually decreased. Between 1962 and 1977, it decreased drastically, dropping from about 20 per cent to about 5 per cent. As a result, during the same period the exploitation of softwoods and hardwoods increased, primarily *mijao*, *saqui-saqui* and *saman*. In light of the pattern of production, we can deduce that during the early years high-quality species represented approximately 50 per cent of the total exploitation and now represent less than 6 per cent of that exploited.

During the period 1983–1988, the data, according to figure 4, shows that the trend of production of high-quality species (cedar and mahogany) continued well below 5 per cent, representing a decrease of natural populations. The exploitation of softwoods increased to an average of 54 per cent and the hardwoods continued at approximately 42 per cent.

More recently, the data for the species *Swietenia macrophylla*, according to figure 5, also show a decrease of the species range around an average for the period 1969-1976 of 18,725 cubic metres, 1984-1998 of 9,344 cubic metres and 1990-1999 of 4,416 cubic metres. The lowest level of production was 1,919 cubic metres of timber in 1999.

VIII. REGISTRY OF FOREST PLANTATIONS

In Venezuela, there are areas planted with the species *S. macrophylla* and other forest species such as *teca*, *melina*, *pardillo*, *cedro* and *apamate*. According to data, figure 6, approximately eight national forest plantation projects have been registered, with a total of 1,462 hectares in the states of Cojedes (1,048), Mérida (17), Barinas (260) and Yaracuy (135).

IX. AGREED ACTIVITIES

Immediate Activities

- Approval and publication of the MARN resolution to restrict exploitation of *Swietenia macrophylla*.
- Listing of the species in Appendix III of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).
- Presentation of the project "Population Survey of *Swietenia macrophylla* King in Venezuela" in order to support obtaining international financing for a diagnosis of the status of the population of that species in its natural environment.

Short-term activities

- Update information using the work of FAO, especially the network for cooperation on the genetic resources of species of Meliaceae.
- Organize subjects for study based on fundamental research, either university thesis, research or other work.
- Gather accurate information regarding private forest plantations of these species in Venezuela in order to coordinate the gathering of data and define research activities.
- Organize a working group coordinated by MARN with the participation of the Instituto Forestal Latinoamericano and the Universidad de los Andes and other agencies and interested persons in order to create a specific study programme for mahogany and improve the steps adopted by countries to reduce the risk of extinction of the species.
- Coordinate a programme on the survey of the existence of the mahogany in natural forests and plantations under the Proyecto Estudio Poblacional.

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XI. ANNEXES

Illustration 1 Geographical distribution of *Swietenia macrophylla* in Venezuela.

Illustration 2 Morphological characteristics of *Swietenia macrophylla*.

Figure 1 Production of *Swietenia macrophylla* by location (1972).

Figure 2 Production by species (1998-1999).

Figure 3 Exploitation of timber (1938-1977).

Figure 4 Exploitation of timber (1983-1988).

Figure 5 Exploitation of *Swietenia macrophylla* (1969-1976; 1984-1987; 1990-1999).

Figure 6 Registry of forest plantations (1998-1999).

Illustration 1. Geographical distribution of *Swietenia macrophylla* in Venezuela.

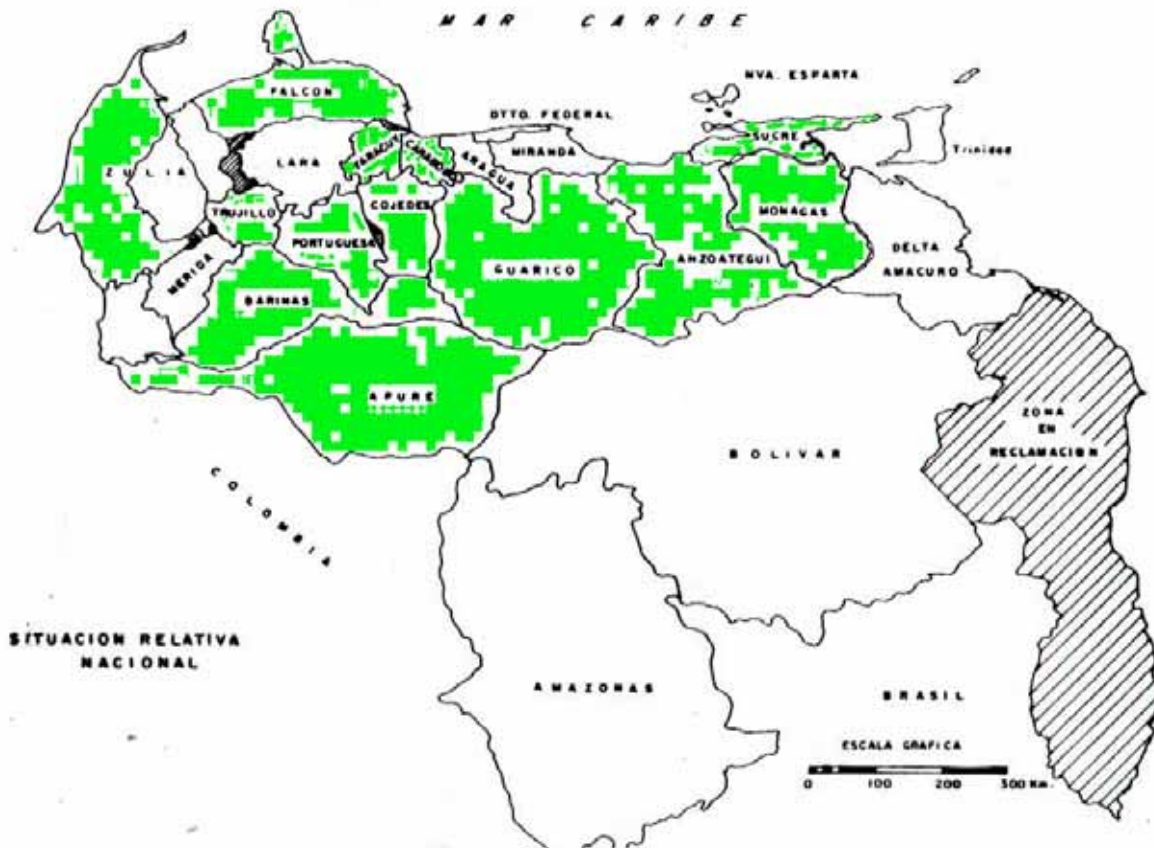


Illustration 2. Morphological characteristics of *Swietenia macrophylla*.

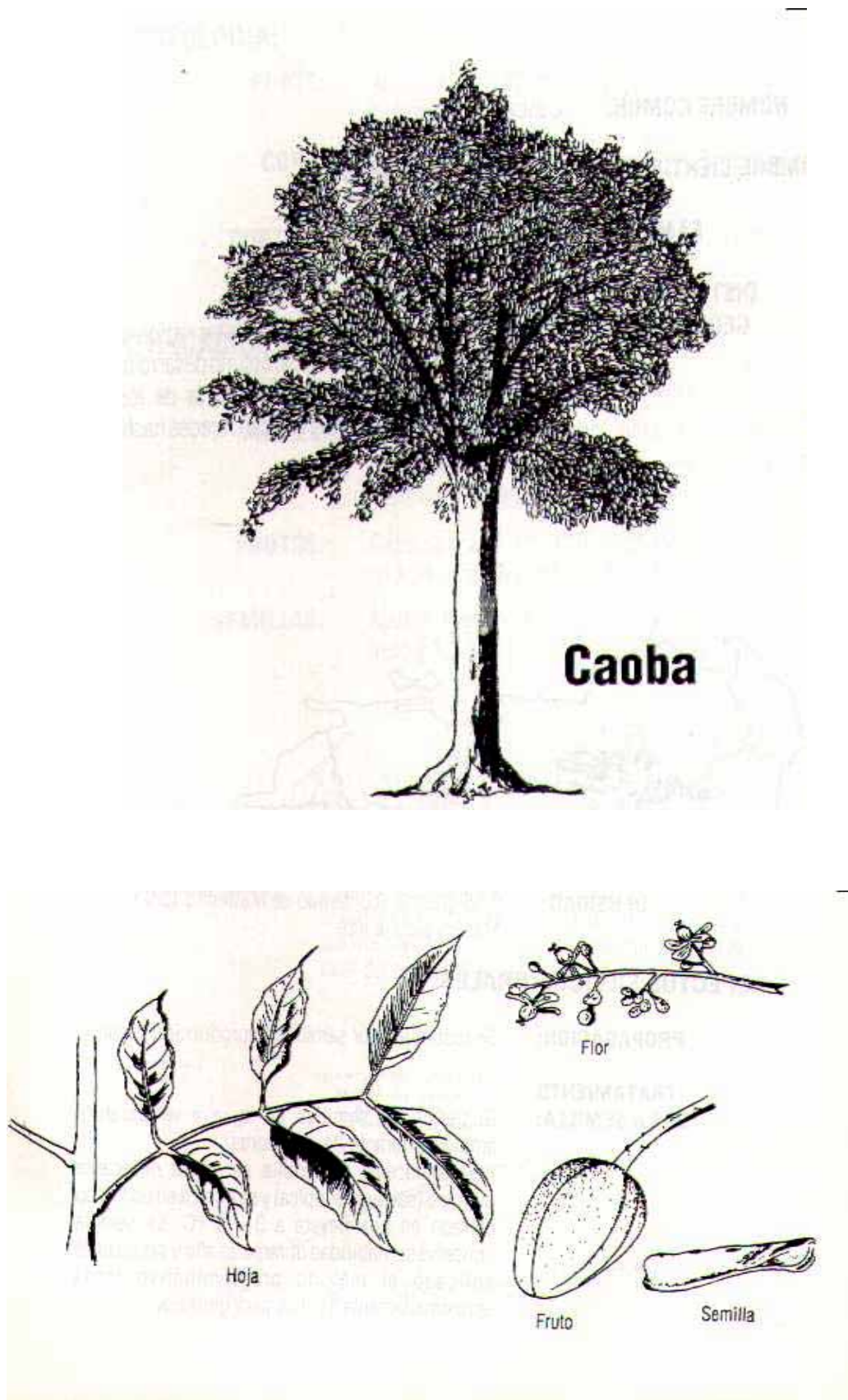


Figure 1. Production of *Swietenia macrophylla* by location (1972).

| STATES | PRODUCTION (m ³) |
|------------------|------------------------------|
| DISTRITO FEDERAL | 23 |
| APURE | 500 |
| ARAGUA | 178 |
| BARINAS | 4.734 |
| CARABOBO | 34 |
| COJEDES | 2.696 |
| FALCÓN | 114 |
| LARA | 3 |
| MIRANDA | 1.309 |
| MONAGAS | 1 |
| PORTUGUESA | 12.950 |
| TACHIRA | 15 |
| YARACUY | 16 |
| ZULIA | 34 |

SOURCE: MAC, Anuario Estadístico, 1.972

Figure 2. Production by species (1998 - 1999)

| Species | Production (<i>m</i> ³ of.) | Per cent |
|---|---|----------|
| <i>Bombacopsis quinata</i> (Saqui-saqui) | 57.925,463 | 15,15 |
| <i>Erisma uncinatum</i> (Mureillo) | 45.304,217 | 11,85 |
| <i>Pithecelobium samán</i> (Samán) | 44.737,022 | 11,70 |
| <i>Pterocarpus acapulcensis</i> (Drago) | 10.126,409 | 2,65 |
| <i>Catostemma comune</i> (Baraman) | 9.515,352 | 2,49 |
| <i>Cedrela odorata</i> (Cedro) | 8.210,742 | 2,15 |
| <i>Ceiba pentandra</i> (Ceiba) | 6.973,423 | 1,82 |
| <i>Tabebuia serratifolia</i> (Puy) | 5.758,397 | 1,51 |
| <i>Anacardium excelsum</i> (Mijao) | 5.271,689 | 1,38 |
| <i>Enterolobium cyclocarpum</i> (Caro-caro) | 5.031,673 | 1,32 |
| <i>Spondias mombin</i> (Jobo) | 4.752,800 | 1,24 |
| <i>Manilkara bidentata</i> (Purguo) | 4.728,729 | 1,24 |
| <i>Brosimum alicastrum</i> (Charo) | 4.564,396 | 1,19 |
| <i>Carapa guianensis</i> (Carapa) | 4.499,027 | 1,18 |
| <i>Peltogyne porphyrocardia</i> (Zapatero) | 3.933,067 | 1,03 |
| <i>Swietenia macrophylla</i> (Caoba) | 1.919,000 | 0,50 |
| Miscellaneous | 159.014,288 | 41,60 |
| Total | 382.265,694 | |

Source: MARN, 1999. (unpublished statistical data).

Figure 3. Exploitation of timber (1938-1977)

| YEAR | HIGH-QUALITY | | HARD | | SOFTS | | TOTAL | |
|-----------------|----------------|--------------|----------------|--------------|----------------|----------|----------------|----------|
| | m ³ | Per cent | m ³ | Per cent | m ³ | Per cent | m ³ | Per cent |
| 1938 | 11.107 | 45 | 4.001 | 16 | 9.632 | 39 | 24.740 | 100 |
| 1939 | 26.467 | 39 | 21.475 | 32 | 19.479 | 29 | 67.421 | 100 |
| 1940 | 16.831 | 45 | 7.603 | 20 | 13.413 | 35 | 37.847 | 100 |
| 1941 | 33.949 | 60 | 7.432 | 13 | 15.083 | 27 | 56.464 | 100 |
| 1942 | 25.503 | 44 | 10.375 | 18 | 22.482 | 38 | 58.360 | 100 |
| 1943 | 38.542 | 50 | 10.068 | 13 | 29.158 | 37 | 77.768 | 100 |
| 1944 | 42.707 | 47 | 11.840 | 13 | 35.510 | 40 | 90.057 | 100 |
| 1945 | 44.990 | 45 | 11.402 | 12 | 42.376 | 43 | 98.768 | 100 |
| 1946 | 65.923 | 46 | 17.746 | 12 | 60.981 | 42 | 144.650 | 100 |
| 1947 | 69.636 | 46 | 20.802 | 14 | 60.870 | 40 | 151.308 | 100 |
| 1948 | 67.903 | 44 | 22.436 | 15 | 62.084 | 41 | 152.423 | 100 |
| 1949 | 85.942 | 43 | 18.704 | 9 | 95.963 | 48 | 200.609 | 100 |
| 1950 | 69.918 | 36 | 25.360 | 13 | 98.253 | 51 | 193.531 | 100 |
| 1951 | 91.043 | 44 | 22.321 | 11 | 94.016 | 45 | 207.380 | 100 |
| 1952 | 75.732 | 40 | 23.723 | 13 | 89.069 | 47 | 188.524 | 100 |
| 1953 | 85.620 | 37 | 29.245 | 13 | 114.236 | 50 | 229.101 | 100 |
| 1954 | 79.798 | 37 | 28.319 | 13 | 107.845 | 50 | 215.962 | 100 |
| 1955 | 70.092 | 29 | 30.160 | 12 | 143.506 | 59 | 243.758 | 100 |
| 1956 | 59.320 | 28 | 34.746 | 16 | 120.563 | 56 | 214.629 | 100 |
| 1957 | 76.037 | 28 | 41.528 | 15 | 156.232 | 57 | 273.797 | 100 |
| 1958 | 84.494 | 31 | 33.534 | 13 | 150.703 | 56 | 268.731 | 100 |
| 1959 | 67.073 | 25 | 42.655 | 16 | 156.306 | 59 | 266.034 | 100 |
| 1960 | 64.214 | 23 | 40.346 | 15 | 171.857 | 62 | 276.417 | 100 |
| 1961 | 74.480 | 29 | 37.389 | 15 | 155.329 | 57 | 272.198 | 100 |
| 1962 | 58.235 | 20 | 43.892 | 15 | 185.368 | 65 | 287.495 | 100 |
| 1963 | 44.774 | 14 | 64.876 | 20 | 210.553 | 66 | 320.203 | 100 |
| 1964 | 65.078 | 16 | 70.284 | 17 | 272.190 | 67 | 407.552 | 100 |
| 1965 | 60.898 | 14 | 71.854 | 16 | 305.763 | 70 | 438.515 | 100 |
| 1966 | 59.623 | 13 | 74.694 | 17 | 317.862 | 70 | 452.179 | 100 |
| 1967 | 56.358 | 13 | 90.921 | 20 | 300.173 | 67 | 447.452 | 100 |
| 1968 | 49.419 | 11 | 80.513 | 18 | 333.448 | 72 | 463.380 | 100 |
| 1969 | 42.378 | 10 | 77.614 | 19 | 294.678 | 71 | 414.670 | 100 |
| 1970 | 31.452 | 7 | 74.486 | 17 | 331.506 | 76 | 437.444 | 100 |
| 1971 | 38.327 | 8 | 96.434 | 21 | 335.294 | 71 | 470.055 | 100 |
| 1972 | 42.224 | 8 | 108.534 | 19 | 409.696 | 73 | 560.454 | 100 |
| 1973 | 33.894 | 6 | 118.857 | 21 | 402.555 | 73 | 555.306 | 100 |
| 1974 | 29.200 | 6 | 108.572 | 23 | 344.477 | 71 | 482.249 | 100 |
| 1975 | 27.721 | 5 | 113.866 | 22 | 376.627 | 73 | 518.214 | 100 |
| 1976 | 20.351 | 5 | 83.831 | 23 | 263.479 | 72 | 367.661 | 100 |
| 1977 | 14.661 | 5 | 60.778 | 23 | 191.120 | 72 | 266.559 | 100 |
| Promedio | | 27,55 | | 16,57 | | | 272245 | |

SOURCE: MAC. Anuario Estadístico de Venezuela, 1938 - 1977

Figure 4. Exploitation of timber (1983-1988)

| YEAR | HIGH-QUALITY | | HARD | | SOFT | | TOTAL | |
|----------|----------------|----------|----------------|----------|----------------|----------|----------------|----------|
| | m ³ | Per cent | m ³ | Per cent | m ³ | Per cent | m ³ | Per cent |
| 1983 | 17.482 | 4 | 300.816 | 70 | 114.396 | 26 | 432.694 | 100 |
| 1984 | 17899 | 4 | 215.270 | 50 | 195.547 | 46 | 428.716 | 100 |
| 1985 | 17442 | 5 | 117.438 | 31 | 244.015 | 64 | 378.895 | 100 |
| 1986 | 15.894 | 4 | 129.286 | 32 | 256.192 | 64 | 401.372 | 100 |
| 1987 | 29.871 | 5 | 208.447 | 34 | 378.165 | 61 | 616.483 | 100 |
| 1988 | 33.953 | 6 | 199.507 | 32 | 387.857 | 62 | 621.317 | 100 |
| Promedio | | 4,6 | | 41,5 | | 53,83 | 479.913 | |

SOURCE: MAC. Anuario Estadístico de Venezuela, 1983 – 1988

Figure 5. Exploitation of *Swietenia macrophylla* (1969-1976; 1984-1987; 1990-1999).

| Year | m ³ |
|------|----------------|
| 1969 | 23.146 |
| 1970 | 18.325 |
| 1971 | 23.764 |
| 1972 | 22.607 |
| 1973 | 18.813 |
| 1974 | 15.190 |
| 1975 | 15.714 |
| 1976 | 12.221 |

SOURCE: MAC

| Year | m ³ |
|-------|----------------|
| 1.984 | 6.414 |
| 1.985 | 10.059 |
| 1.986 | 7.856 |
| 1.987 | 10.786 |

SOURCE: MARN

| Year | m ³ |
|-------|----------------|
| 1.990 | 3.283 |
| 1.991 | 5.650 |
| 1.992 | 12.375 |
| 1.993 | 2.380 |
| 1.994 | 2.579 |
| 1.995 | 5.302 |
| 1.996 | 4.452 |
| 1.997 | 3.617 |
| 1.998 | 2.603 |
| 1.999 | 1.919 |

SOURCE: MARN

Figure 6. Registry of forest plantations (1998-1999).

| Project | Area (ha) | Location | Registry number | Year |
|---|-----------|--|-----------------|------|
| Plantations of <i>teca</i> , <i>melina</i> , <i>caoba</i> , <i>pardillo</i> , <i>cedro</i> and others | 1048 | Cojedes-Mcpio. | C.R.8-P-011 | 1998 |
| Plantations of <i>caoba</i> and <i>apamate</i> | 260 | Barinas-Mcpio. Ezequiel Zamora | C.R-05-P-015 | 1999 |
| Plantations of <i>cedro</i> , <i>pardillo</i> , <i>caoba</i> and <i>café</i> | 2 | Mérida Mcpio. Tulio Febre Cordero | C.R. 12.P-18 | 1999 |
| Plantations of <i>cedro</i> , <i>caoba</i> , <i>apamate</i> and <i>pardillo</i> | 3 | Mérida Mcpio. Alberto Adriani | C.R. 12.P-023 | 1999 |
| Plantations of <i>teca</i> , <i>caoba</i> , <i>cedro</i> , <i>partillo</i> and <i>melina</i> | 3 | Mérida Mcpio. Alberto Adriani | C.R. 12.P.024 | 1999 |
| Plantations of <i>cedro</i> and <i>caoba</i> | 9 | Mérida Mcpio. Campo Elias Adriani | C.R. 12.P-029 | 1999 |
| Plantations of <i>cedro</i> , <i>caoba</i> and <i>pardillo</i> | 2 | Mérida Mcpio. Ramos de Lora | C.R. 12.P.031 | 1999 |
| Plantations of <i>caoba</i> , <i>teca</i> and <i>pardillo</i> | 135 | Yaracuy Mcpio. San Javier Del Dtto. San Felipe | C.R. 20-P-032 | 1999 |

Source: MARN. Dirección General del Recurso Forestal, Período 1998-1999

Mcpio= Municipio; Dtto= Distrito