



Use of wood from the National Forests to build Regional Offices of IBAMA-Brazil

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ABSTRACT

Brazil possesses a great variety of wood species of economic value but not used by the market. The present work presents a proposal of rationalized use of well-known and not very known wood species found in the Brazilian National Forests, objectifying the construction of IBAMA's Regional Offices. In these constructions a new structural and constructive system is used in wood, composed by panels armed with metallic bars that work as walls in a group of pillars and beams, which could also be used as floor panels and covering.

INTRODUCTION

Brazil has about 30% of the planet tropical forests and the Amazon area has the largest variability of species with economic value to be explored. However, the wood industry uses only a few species, usually called "the commercial species," generating a vicious cycle: the consumer ignores and don't accept to use not very known species, and, on the other hand, the producers ignore these species because there won't be demand on the part of the consuming market.

The Forest Products Laboratory of IBAMA has been working for more than 25 years researching and developing technologies to improve the wood utilization in Brazil. A special emphasis is given to the amazon species, and particularly to the not very known ones, objectifying to turn them more attractive to the market and to contribute for reduction of harmful practices in the Brazilian forest section, for example, the selective extraction.

The National Forests (FLONAS) are areas of federal domain provided of native or planted species, whose objectives are to promoting the natural resources management. The emphasis is in the wood production and other forest products. They exist also to guarantee the protection of these resources, to foment scientific research development, environmental education, recreation, and tourism. Brazil possesses 49 National Forests, with a total area of 15.239.766,12 ha being more than 90% in the Amazon region. (Figure1)

The Project UNDP BRA 97/044 - Sustentable Forest Development, proposed the multiple wood resources uses, well-known and not very known species from the FLONAS, for the construction of Regional Offices of IBAMA in different country areas.

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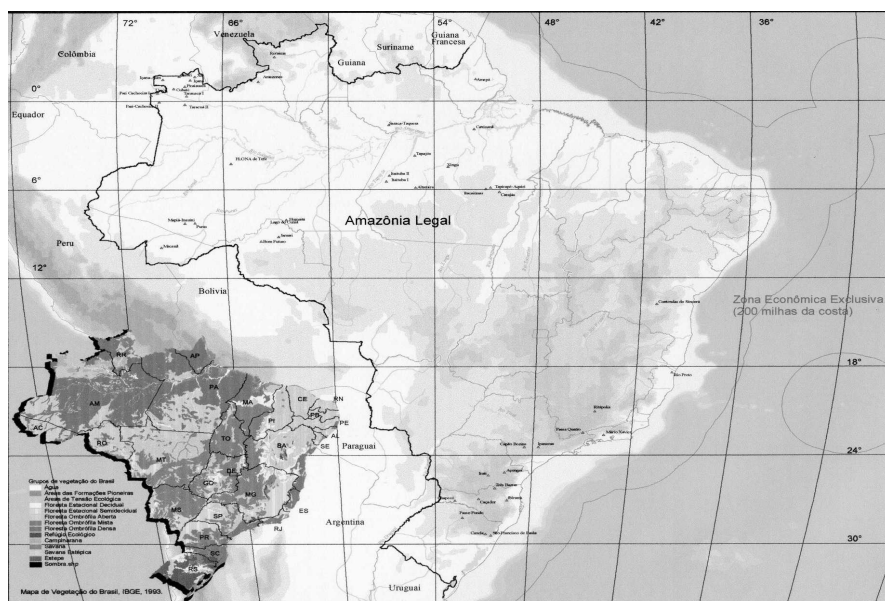


Figure 1 – Brazil's National Forests

METHODOLOGY

The Regional Offices projects were developed starting from the following conditions: offices basic needs; edafo-climatic characteristics; wood species identification and availability in the FLONA or in the local market and labor qualification. Through some detailed operation studies of the current offices, their functions and activities were identified and defined. They were designed starting from a structural modulation, so that the buildings could show the same characteristic independent of the built area.

Being added to these elements, the architectural conception should obey a building standardization, to transmit to the user the corporate image, forming an alliance between the aesthetics of wood with the image of a public institution working in the environmental area, as it is the case of IBAMA. In the search of this standardization, elements of our architecture and climate were used as several roof levels, extended roofs, ceramic tiles, stones, use of the colors, shading elements, as observed in the Paragominas, PA, Regional Office proposal, (Figure 2).

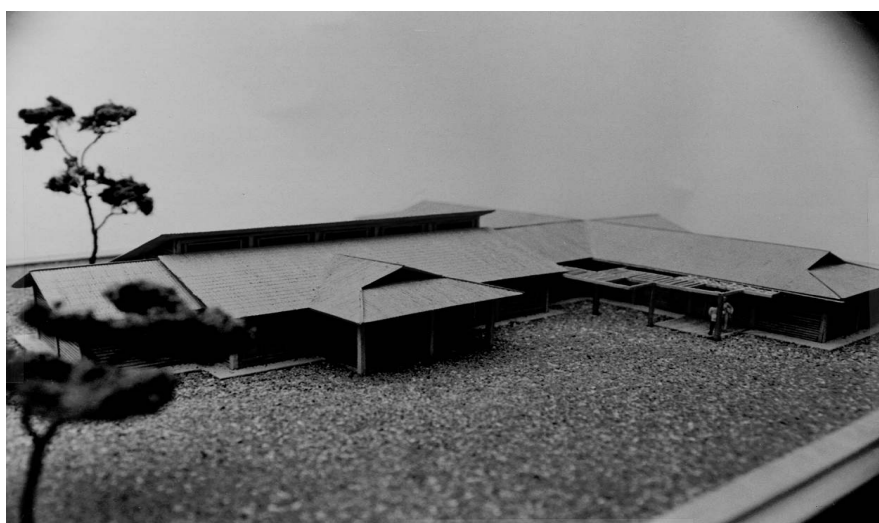


Figure 2 – Model of Paragominas's Regional Office

CONSTRUCTIVE SYSTEM IN WOOD

The structural and constructive system proposed for the constructions is composed by panels in solid wood pieces armed with metallic bars that work as walls, being able to be also used as floors and roofs. This system uses medium and high density wood species which are 3 cm thick, 15 cm wide and 4,80 m long. These long panels represent a

great advantage in relation to the traditional systems, which uses small spaces between pillars and support elements. The rigidity provided by the metallic bars also allows the joining elimination between pieces, simplifying the panel production.

Complementing this system, there are the pillars and beams, that, besides the aesthetics value, they contribute to optimize the constructive process allowing the manufacturer to execute the panels at the same time that the work is raised. This independence also favors the maintenance because it is easy to change a panel or part of it. The option for this structural and constructive system (Figure3) resulted of its excellent performance in place of difficult access and maintenance and subject to bad weather, as in the case of the Scientific Station Archipelago São Pedro e São Paulo.

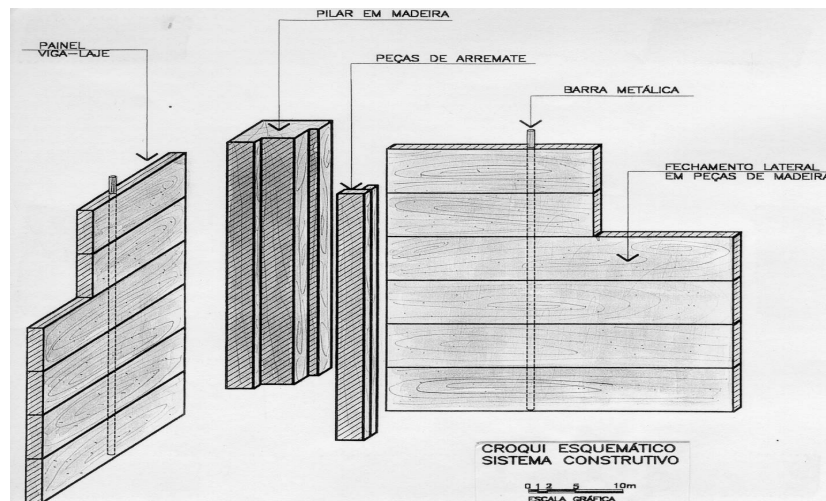


Figure 3 – Detail of the panel.

It was considered for the construction system for the Regional Offices of IBAMA: great variability and readiness of well-known not very well-known species with densities varying from medium to high; rationalized constructive system, pre-fabrication of pieces and components (panels); architectural conception defined in a structural modulation; determination of an aesthetic pattern for different constructions in different areas; use of natural climatization elements as ventilation and illumination; construction in places of difficult access; use of not very qualified labor and simple equipment.

THE REGIONAL OFFICE OF CHAPECÓ – SC

The experience to construct the Regional Office of Chapecó - SC reveals the advantages and virtues of the adopted constructive system, where the builder, in the case a company, in spite of the little familiarity with wood, didn't have difficulties in the construction execution.

Starting from the projects and models elaboration, the panels and structure construction were initiated simultaneously. The wood species used were Garapeira (*Goupia glabra*) for the panels and Itaúba (*Mezilaurus itauba*) in the pillars and beams. These are Amazonian species that began to be used in the south of the country, contributing to a larger diversification in the local wood market. The independence between the walls and structure provides two work fronts, being one in construction site and the other in the joinery doing the panels, whose simplified fabrication doesn't demand more than precision in the demarcation and execution of holes in the pieces, once they are rectangular without use of fittings like grooved and tongue (Figure 4). In a more advanced stage, the panels are installed in the structure, being adjusted and tight in agreement with its positioning in the building (Figure 5). The internal divisions contribute to a larger rigidity of these panels. When this is not possible, necessary braces can be executed with the same metallic bars used in the panels.

For the wood protection in the contact with soil, chemical are used and also constructive details as the building elevation and pillars fixation with pins. The walls may be finished with synthetic enamels to increase durability.

The final result is a quite stable and robust construction, with an architectural aesthetics that it is not depreciated by structural and constructive modulation. It exposes the vigor of wood forming an alliance with the need of transmitting to the user, the precepts of quality services rendered by a public institution, as it is the case of IBAMA.



Figure 4 – The fabrication of the panels.



Figure 5 – The installation of the panels in the structure.



Figure 6 – Chapeco's Regional Office shows a quite stable and robust construction, and it exposes all the vigor of wood.

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