Project “PIMADS”

Project ITTO – PD 433/06 Rev.3 (I)

Sustainable Model for the Brazilian Wood Flooring Production Chain

ANPM BRASIL
ASSOCIAÇÃO NACIONAL DOS PRODUTORES DE PISOS DE MADEIRA
NATIONAL HARDWOOD FLOORING ASSOCIATION - BRAZIL

ITTO

www.pimads.org

Project PIMADS – Sustainable Wood Flooring

"Sustainable Model for the Brazilian Wood Flooring Production Chain"

This Project started in 2011 and covers the entire supply chain related to wood flooring. The overall objective is to contribute to the sustainable use and to increase the efficiency in the use of forest resources, from forest to final product. The Project's actions involves a greater use of trade tree species and of the less used species today, raising the efficiency of forest management; improvement of the drying process and production, adding value and quality to products; reduce and better use of residues; development of technical standards and establishment of the Quality Certification Program; and training for employees of forest companies. This project is being executed by ANPM (National Hardwood Flooring Association), with funds provided by the ITTO (International Tropical Timber Organization) and counts with the collaboration of the Ministry of the Agriculture of Brazil (EMBRAPA/MAPA), Ministry of the Environment of Brazil (LPF/SFB/MMA) Ministry of External Relations of Brazil (ABC/MRE), University of Brasilia (EFL/UNB), Pará State University (CCNT/UEPA) and University of São Paulo (ESALQ/USP).

Objectives

- To contribute for sustainable and adequate utilization of the Brazilian Amazon forest resources.
- To increase the environmental, social and economic sustainability of wood flooring production chain: from the forest to the final product.

The present project, despite its wide range of activities, approaches the production chain and connects the sustainable forest management to the manufacturing process. Its execution should contribute to the better conservation and utilization of forest resources, resulting in:

- Valorization of sustainable forest management, through experimental results and data;
- Value added to wood flooring;
- More efficient processes to manufacture wood flooring, with less residues;
- Better technical qualification of industries employees.

Activities

The project envisages the achievement of three specific outputs that, in an integrated manner, should contribute significantly to the development of the entire production chain related to wood floors and encourage forest management. The three outputs and their activities are described below:

Output 01 – Proposing a management model to integrate the exploration and use of lumber of commercial and less used species.

Summary of Activities:

- Identification and selection of potential species.
- Technological characterization and grouping of species (including physical and mechanical tests as density, shrinkage and hardness; behavior in artificial drying; machining and finishing; superficial hardening).

– Pilot production of flooring with lesser used species.
– Proposal of a management model to explore commercial timber and less used species.
– Preparation of material for commercial dissemination of the species with suitable wood for the manufacture of wood floors.

Main Results:
– Selection of species. The table below shows the species originally selected for the project.

Nome Comum	Nome Científico
Angelim da Mata	*Hymenolobium excelsum*
Angelim Vermelho	*Dinizia excelsa*
Castanha Sapucaia	*Lecythis pisonis*
Cedrinho	*Erisma uncinatum*
Cupiúba	*Goupia glabra*
Itaúba Amarela	*Mezilaurus itauba*
Jarana Amarela	*Lecythis poiteauri*
Mandioqueira Escamosa	*Qualea paraensis*
Maparajuba	*Manilkara bidentada*
Pequiá	*Caryocar villosum*
Sucupira Preta	*Bowdichia nitida*
Tachi Preto	*Tachigali myrmecophyla*
Tanibuca	*Buchenavia parvifolia*
Timborana	*Piptadenia gonoacantha*

The species selected were obtained from areas of the company ORSA FLORESTAL located in Pará state / Brazil, which is certified by FSC (Forest Stewardship Council), ensuring that the cutting of trees follows the legal and proper management of forest resources. The photos 1 at 6 show information about the exploration of the species.

– Technological characterization. The photos 7 at 12 show the performance of some physical and mechanical tests. The final results will be published later in a specific publication.

Output 02 – Proposing a model to reach a manufacturing process more efficient and integrated.

Summary of Activities:
– Tests to set conventional drying schedules, grouping of species and for correction and calibration of moisture electric meters.
– Elaboration of proposal for residues management, highlighting potential indications for use in value-added products.
– Courses and trainings in conventional drying and quality control of dry wood, reduction of residues generation and residues management.


1 Location of the trees


2 Identification / Traceability


3 Cutting


4 Analysis and Measurements


5 Botanical Identification


6 Identification of the Woods


7 Specific Gravity (Density)


8 Janka Hardness


9 Static Bending


10 Turning


11 Drilling


12 Abrasion

Main Results:

– Drying and Moisture. The photos 13 at 18 show the trials related to drying and moisture measurements. The final results will be published later in a specific publication.

– Residues Management. The photos 19 at 22 show the types of wood residues generated by industries. The final results will be published later in a specific publication.

– Courses and trainings. The following tables present the preliminary content of the publications that are reference materials for the courses.

Content Publication Wood Drying and Quality Control

1- Fundamentals of Wood Drying
  1.1. Basics of Drying
  1.2. Methods for the Moisture Determination
  1.3. Relations between Wood and Moisture
  1.4. Factors related to Speed of Drying
  1.5. Defects related to Process
2- Conventional Drying
  2.1. Types of Dryers
  2.2. Maintenance of Dryers
  2.3. Preparation of the Wood for Drying
  2.4. Drying Schedules
3- Process and Quality Control
  3.1. Measurement and Control Instruments
  3.2. Types of Controllers
  3.3. Execution of Drying
  3.4. Control and Quality Testing
  3.5. Storage of Dry Wood

Content Publications Reduction and Residue Management

1- Legal Obligations and Penalties
2- Residues and its Classifications
3- Residues Management
4- Residue of the Mechanical Wood Processing
5- Practices to Reduce the Residue Generation
6- Valuation of the Residues
7- Treatment of Disposition
8- Preparation of Residue Management Plans

Output 03 – Quality Certification Program for wood flooring.

Summary of Activities:

– Elaboration of official Technical Standards to lumber and wood floors.

– Developing a Quality Certification Program and submission to INMETRO (National Institute of Metrology, Quality and Technology – Brazil).

– Audits of Quality Certification.

– Courses and trainings for auditors in accordance with Quality Certification Program and for users involving the installation and maintenance of wood floors.

Main Results:

– Technical Standards. The following Table presents the technical standards related to lumber and wood floors already made official by the ABNT - Brazilian Association of Technical Standards.

Technical Standards made official by the ABNT
NBR 15798 – Wood Flooring - Terminology
NBR 15799 – Wood Flooring prefinished and unfinished – Patterning and Classification
NBR ISO 737 – Coniferous Sawn Timber – Sizes – Methods of Measurement
NBR ISO 738 – Coniferous Sawn Timber – Sizes – Permissible Deviations and Shrinkage
NBR ISO 1030 – Coniferous Sawn Timber – Defects – Measurement
NBR ISO 1032 – Coniferous Sawn Timber – Sizes – Terms and Definitions
NBR ISO 3179 – Coniferous Sawn Timber – Nominal Dimensions
NBR ISO 2299 – Swan Timber of Broadleaved Species – Defects – Classification
NBR ISO 2301 – Swan Timber of Broadleaved Species – Defects – Measurement
NBR ISO 8903 – Swan Timber of Broadleaved Species – Nominal Sizes
NBR ISO 4470 – Swan Timber – Determination of the average moisture content of a lot

– Quality Certification Program. Two internal standards called "Audit Procedures" and "Management for the Utilization of the Quality Trademark" are already prepared. The program is already being evaluated by INMETRO. The photos 23 at 28 show the procedures related to the development of the Quality Program.

Discussions with Researches and Industries

Discussions with INMETRO

Audit – Dimensions Checking

Audit – Warping Checking

Audit – Panel Analysis

Audit – Defects Checking

Models of Quality Trademark

– Courses and trainings. The following tables present the preliminary contents of the publications that are reference materials for the courses.

Content Published Auditors Quality Certification

1- General Part
- 1.1. Basics
- 1.2. The Auditor's Profile and Code of Ethics
- 1.3. Audits Planning
- 1.4. Audits Executing
- 1.5. Practices and Records of Audit

2- Specific Part
- 2.1. Standards Related to Wood Flooring
- 2.2. Quality and Standardization of Wood Flooring
- 2.3. Analysis of Dimension, Defect and Moisture Content
- 2.4. Audit Procedures
- 2.5. Management for the Use of Quality Trademark

3- Practical Training / Audit Simulation

Content Publishing Installation and Maintenance of Wood Flooring

1- The Wood Material
2- Wood Flooring
3- Counterfloor
4- Waterproofing
5- Fixing Types
6- Installation
7- Surface Finishing
8- Conservation and Maintenance
9- Problems and Solutions

Extra Outputs

The extra outputs are additional activities not initially foreseen in the project and considered important to be developed. The following are some information about the activities.

Activity A – Thermomechanic Modification and Wood Wettability (photos 29 at 33)

– Importance: It may increase the hardness of the wood and analyzes its capacity to absorb water.

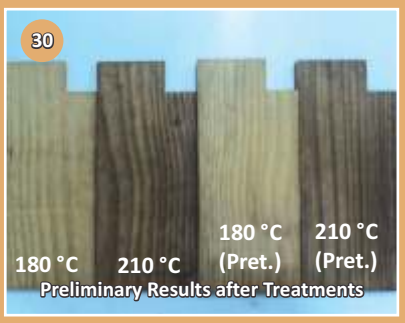
Activity B – Dendrochronological Analysis of the Species (photos 34 and 35)

– Importance: It studies the growth rings and the age of the trees and also the interactions with the environment and climate in forests.

Activity C – Manufacture of Wood Panels with Residues (photos 36 at 39)

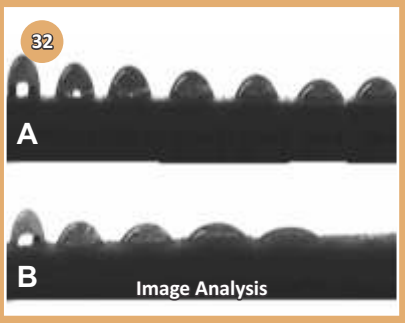
– Importance: Analyze the technical viability of the manufacturing of wood panels with residues generated throughout the project. It can be an alternative for residues recovery in the industries.


29 Pressing of Wood Samples

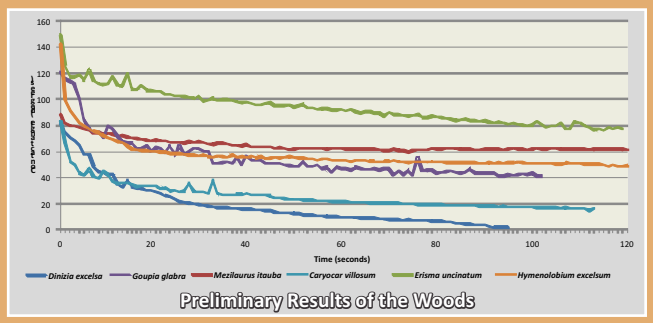


30 Preliminary Results after Treatments


31 Wettability Test



32 Image Analysis



33 Preliminary Results of the Woods


34 Wood Discs Cut in the Forest


35 Wood Discs Sanded for Analysis


36 Wood Chipper (Input)


37 Wood Chipper (Output)


38 Collecting Shavings


39 Drying of Shavings

Expected Results

With the development of this project is expected to achieve the following results:

- Increase the area of forest under sustainable forest management, properly approved by the governmental agency responsible.
- Reduce deforested and burned areas.
- Reduce the consumption of wood from areas with no management.
- Increase the efficiency of forestry.
- Physical and mechanical characterization of lesser known wood species.
- Promotional manual describing wood species (commercial and less known) used for the flooring production.
- Increase the number of wood species used for the production of floors.
- Reduce the generation of residues.
- Increase the use of residues for the manufacture of new products.
- Educational material (CD, publications, website) for technical training in drying, quality control and reduction of residues.
- Offer courses about drying and quality control.
- Offer courses about residue management.
- ABNT Standards established for lumber and wood floors.
- "Mark of Conformity" (originated from the Quality Certification Program) available for industries.
- Provide courses for auditors, in accordance with the Quality Certification Program.
- Provide courses for installation and maintenance of wood flooring.
- Instructions and guidelines to consumers based on publications.

Contact

ANPM – Associação Nacional dos Produtores de Pisos de Madeira
Rua Campos Salles, 1818 – Sala 64 – Bairro dos Alemães
CEP: 13416-310 – Piracicaba/SP – Brazil
Telefone: +55 (19) 3402 2166 – E-mail: anpm@anpm.org.br
www.anpm.org.br

Detailed information about the Project are in www.pimads.org

Participating Institutions of the Project “PIMADS”

Financial Support

ITTO - International Tropical Timber Organization
The ITTO is an intergovernmental organization that promotes the conservation, management, use and sustainable trade of tropical forest resources. ITTO member countries represent around 80% of tropical forests worldwide and around 90% of worldwide marketing of lumber.

Executing Agency

ANPM - National Hardwood Flooring Association
"The Mission of ANPM is to promote and encourage the use of wood floors and work with the processing industries, promoting the application of the process technology and the sustainability of forest resources. ANPM quest the development of activities that provide aggregation of quality, greater appreciation and encouragement in the use of wood floors. It is expected that the shares of ANPM contribute with all sectors involved in the production, marketing and use of wood floors.

Donor Countries: Japan and Switzerland

Collaborating Institutions

The partner institutions involved in the development of the project are the following:

Universidade de Brasília