

# ACIAR project



FST/2009/062

Development of advanced  
veneer and other products  
from coconut wood to  
enhance livelihoods in South  
Pacific communities

# Content



- Project participants and objectives.
- Project structure.
- Information resources.
- Training program.

# Project organisation

## Commissioning organisation



Australian Government

Australian Centre for  
International Agricultural Research

### **Tony Bartlett**

Forestry Research Program Manager

Australian Centre for International Agricultural Research

## Australia based



Associate Professor **Greg Nolan**

Project Leader, Director CSAW, University of Tasmania

Dr **David Blackburn**

Project Research Fellow, University of Tasmania



**Queensland**  
Government

### **Rob McGavin**

Research Facility and Project Manager, Queensland Department of Agriculture,  
Fisheries (QDAF) Dr **Henri Bailleres**

Team Leader, QDAF

# Project organisations

## Partner country based



### **Sairusi Bulai**

Coordinator, Forest and Trees Group, Pacific Community (SPC)

Ms. **Moana Masau & Ilikimi** Carati Bokadi

Coconut Wood Veneer Technician and Technician Assistant, SPC



### **Semi V. Dranibaka**

Principal Utilisation Officer, Fiji Ministry of Fisheries & Forests



### **Tolusina Pouli**

Forestry Department, Ministry of Natural Resources and the Environment, Somoa

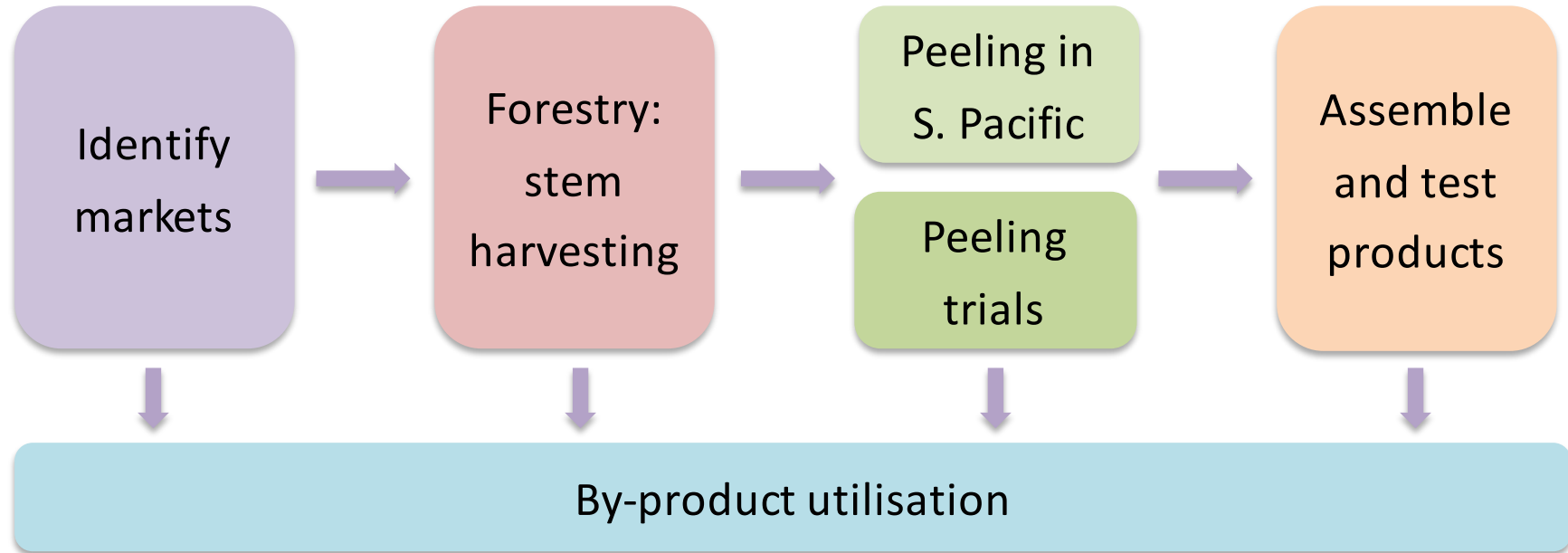


**Ministry of Forestry, Solomon Islands**

### **Reeves Moveni**

Ministry of Forestry Research, Solomon Islands

# Project Objectives



# Objective 1 – Identify Markets

Identify  
markets

***Objective 1*** – Identify the most promising product options for the veneer from coconut stem

## Objective 2 – Forestry

Forestry:  
stem  
harvesting

**Objective 2** - Develop protocols and capacity for sustainable low-impact coconut wood harvesting, plantation rehabilitation, and log grading, handling and transport



Advanced veneer and other product from coconut wood



# Obj. 3 – Veneer peeling in S. Pacific

Peeling in  
S. Pacific

Peeling  
trials

**Objective 3** – Establish experimental veneer-peeling capacity in the South Pacific



Advanced veneer and other product from coconut wood



# Spindle-less lathes



- A spindle-less lathe uses periphery drive rollers to push the log against the blade for peeling.
- This increases recovery over spindled lathes as small diameter logs can be peeled efficiently down to a small residual core.

# Objective 4 – Peeling trials

Peeling in  
S. Pacific

Peeling  
trials

**Objective 4** – Determine the optimum processing parameters & protocols for peeling coconut stems & the properties of the recovered veneer.



# Objective 5 – Products

Assemble  
and test  
products

**Objective 5** – Assemble the product suite and establish its characteristics and in-service performance



## Objective 6 – By-product utilisation

By-  
product  
utilisation

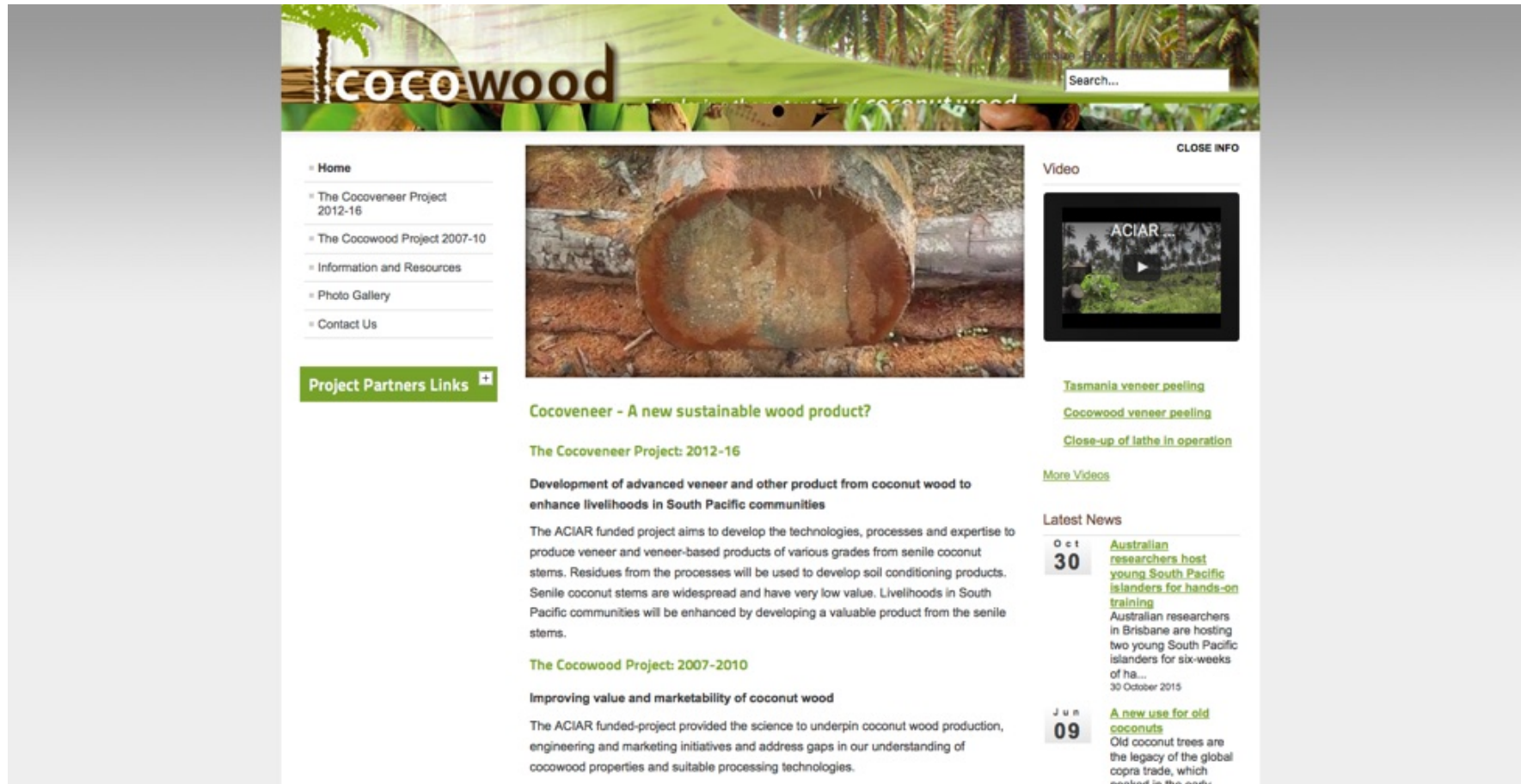
**Objective 6** - Determine the costs and benefits of using the residual cortex and soft, central cores for bio-char and other agricultural products



## Objective 6 – By-product utilisation



# Information: Cocowood.net



The screenshot displays the Cocowood.net website interface. At the top, there is a search bar and a navigation menu with links to Home, The Cocoveneer Project 2012-16, The Cocowood Project 2007-10, Information and Resources, Photo Gallery, and Contact Us. A green button labeled "Project Partners Links" is also visible. The main content area features a large image of a coconut wood cross-section with the heading "Cocoveneer - A new sustainable wood product?". Below this, there are sections for "The Cocoveneer Project: 2012-16" and "The Cocowood Project: 2007-2010", each with a sub-heading and a brief description of the project's goals. To the right, a "Video" section includes a video player and links to "Tasmania veneer peeling", "Cocowood veneer peeling", and "Close-up of lathe in operation". A "Latest News" section lists two articles: "Australian researchers host young South Pacific islanders for hands-on training" dated Oct 30, 2015, and "A new use for old coconuts" dated Jun 09.

**Navigation:**

- Home
- The Cocoveneer Project 2012-16
- The Cocowood Project 2007-10
- Information and Resources
- Photo Gallery
- Contact Us

**Project Partners Links**

## Cocoveneer - A new sustainable wood product?

### The Cocoveneer Project: 2012-16

**Development of advanced veneer and other product from coconut wood to enhance livelihoods in South Pacific communities**

The ACIAR funded project aims to develop the technologies, processes and expertise to produce veneer and veneer-based products of various grades from senile coconut stems. Residues from the processes will be used to develop soil conditioning products. Senile coconut stems are widespread and have very low value. Livelihoods in South Pacific communities will be enhanced by developing a valuable product from the senile stems.

### The Cocowood Project: 2007-2010

**Improving value and marketability of coconut wood**

The ACIAR funded-project provided the science to underpin coconut wood production, engineering and marketing initiatives and address gaps in our understanding of cocowood properties and suitable processing technologies.

**Video**

**Video**

**ACIAR**

[Tasmania veneer peeling](#)

[Cocowood veneer peeling](#)

[Close-up of lathe in operation](#)

[More Videos](#)

**Latest News**

**Oct 30** [Australian researchers host young South Pacific islanders for hands-on training](#)  
Australian researchers in Brisbane are hosting two young South Pacific islanders for six-weeks of ha...  
30 October 2015

**Jun 09** [A new use for old coconuts](#)  
Old coconut trees are the legacy of the global copra trade, which peaked in the early



# Information: Cocowood.net

Cocowood.net contains:

- Videos
- Project notes
- Research reports and more ...

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**Research Notes**

**Project Overview**

This research note outlines an ACIAR-funded project that aims to develop means to sustainably convert senile coconut stems into veneer and veneer-based products, and complementary agricultural products for export or use in Pacific Island economies, particularly Fiji, Samoa and the Solomon Islands. The project focuses on development in these and other Pacific countries.

[Project Overview \(PDF 285KB\)](#)

**Environmental Credentials for Coconut Products**

This research note provides an overview veneer producers to establish environment international marketplace. Environmental three main types: market assurance of supply, and forest certification. Of these environmental credential for wood products.

[Environmental Credentials for Coconut](#)

**Coconut Biochar**

Biochar is a form of charcoal attracting improve soil health, crop productivity etc. However, questions remain about its use in product, limited scientific research to-date research note analyses the biochar by-product the senile coconut stems.

[Coconut Biochar \(PDF 140KB\)](#)

**Cocowood Properties**

This research note gives an overview of produced from the coconut palm (Cocos nucifera).

**Research Note: Cocowood Properties**

This research note provides an overview of the physical, mechanical and chemical properties of wood and veneer recovered from the harvested stem of the coconut palm (Cocos nucifera). It is a development of the Cocowood project note: "Properties and processing facts for cocowood" available at cocowood.net. The stem fibre of the coconut palm is not a true wood. As a monocot (grass), the stem's vascular structure is largely different to that found in traditional timber. The stem has a high density zone towards the periphery while the inner zone is much lower in density. Material from the outer, higher density section has properties similar to many hardwood timbers and boards sawn from it can be suitable for various traditional products including high-value flooring. The stem can also be peeled with the density of the recovered veneer reducing towards the centre of the log. The innermost core and the outlying bark of the coconut stem have low density and may be used for by-products such as composting, wood chips and insulation.

**Introduction**

This research note gives an overview of the properties of wood and veneer produced from the coconut palm (Cocos nucifera). The properties of cocowood are shown in Table 1. Important aspects include:

**Hardness** - Coconut palm fibre or 'wood' density decreases towards the centre of the stem and with height. The highest density fibre occurs around the outer periphery of the stem and is suitable for many end-uses requiring a hard wood. The inner core can be very low density.

**Appearance** - The colour of seasoned cocowood wood ranges from medium to dark brown with prominent, darker, quill-like streaks for high-density outer material to light and pale brown for lower density inner material.

**Durability** - Tested, untreated cocowood has limited natural durability, suggesting it cannot be used in weather-exposed conditions. However, above-ground durability greater than 10 years has been observed for higher density cocowood sawn boards. High density, dry cocowood is not susceptible to the Lyctus beetle and is suitable for use in fully protected applications. Untreated cocowood is not resistant to termite attack.

**Figure 1: Production line for CocoVeneer**

Using Coconut Stems

Coconut stems can be used in the round-form, sawn into board, or peeled into veneer. The outer high-density cocowood can be used for flooring, furniture, joinery, panelling, pallets, plywood and decorative veneers, utility poles (preservative treated) and feature posts. The lower density material can be used in handicrafts, turnery, insulation, charcoal and firewood, or chipped as a base for compost or a potting substrate for plants.

**Processing Coconut Wood and Veneer**

**Sawing** - Cocowood has a high mineral content and large variation in grain angle (caused by the vascular bundle structure) so sharp, specialised tools are needed. High speed steel blades or Stellite-tipped blades and regular sharpening are recommended for breaking down the lignin.

**Balling** - Heated cocowood logs can be rotary peeled

**Figure 2: Coconut log disk and veneer illustrating the concentration of vascular bundles on the log's perimeter**

produces a continuous thin ribbon of CocoVeneer that ranges between 2.5-5.0 mm in thickness.

**Stain-prevention** - Freshly sawn boards or veneer are prone to mould and staining and should be processed rapidly after harvest. An appropriate anti-stain dip may be used if required.

**Drying** - Green boards and veneer have high moisture content and must be processed quickly to avoid deterioration caused by pests and staining. Cocowood boards can be kiln-dried at 60-65° (dry bulb) over 10-14 days, depending on the equipment. The required moisture content for Australian and European markets is 9-14% and 7-11%, respectively.

**Grading** - Key grading parameters of sawn boards for flooring are density (hardness) and straightness (limited spring, twist or bow). The recommended minimum density for flooring is 700kg/m<sup>3</sup> (kane).



# Training program

Training is being provided through:

- Participation in university courses.
- Experience in Australian institutions
- Onsite training in equipment in Suva, Fiji.



# Project summary

This is the last year of a four-year, collaborative project with six specific objectives:

1. Identify the most promising product options for the veneer from coconut stem.
2. Develop protocols and capacity for sustainable low-impact coconut wood harvesting, plantation rehabilitation, and log grading, handling and transport.
3. Establish experimental veneer-peeling capacity in the South Pacific.
4. Determine the optimum processing parameters and protocols for peeling coconut stems and the properties of the recovered veneer.
5. Assemble the product suite and establish its characteristics and in-service performance. Characterisation would be to local and export performance standards.
6. Determine the costs and benefits of using the residual cortex and soft, central cores for bio-char, growing mediums and other agricultural products

# Questions

