

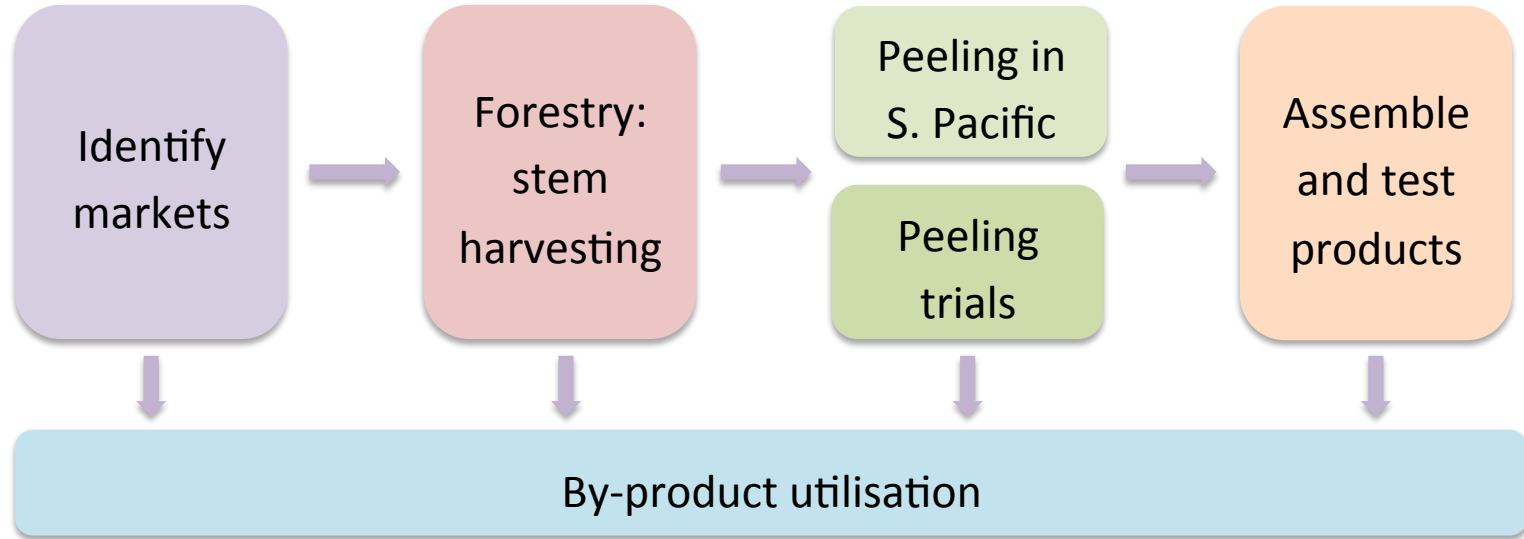
# ACIAR project



FST/2009/062

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

# Project Objectives



# Objective 1 – Identify Markets

Identify  
markets

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

1.1 – Market assessment and product development

1.2 – Value-chain analysis

1.3 – Stakeholder engagement

# Objective 1 – Identify Markets



# Objective 1 – Identify Markets

Identify  
markets

## 1.1 – Market assessment and product development

- Engagement with building designers, builders, producers and industry bodies in local and export markets
- Determine suite of appearance and structural products to develop all-cocoveneer and composite products

# Objective 1 – Identify Markets

Identify  
markets

## 1.2 – Value-chain analysis

- Analysis performed in association with ACIAR's PARDI network
- Costs and recoveries of each stage of production determined
  - This work runs in parallel with technical program
- Explore potential production models.

# Objective 1 – Identify Markets

Identify  
markets

## 1.3 – Stakeholder engagement

- Regular stakeholder engagement meetings.
  - Impact in partner countries is fundamental to the project
- Website and resource packages
- Training days organised

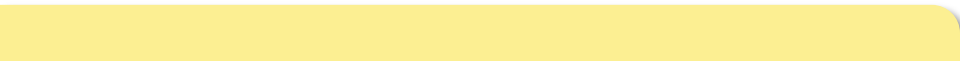
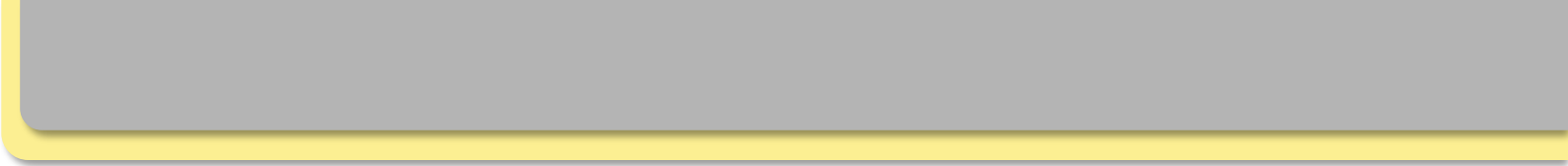
# Objective 1 – Identify Markets

Identify  
markets

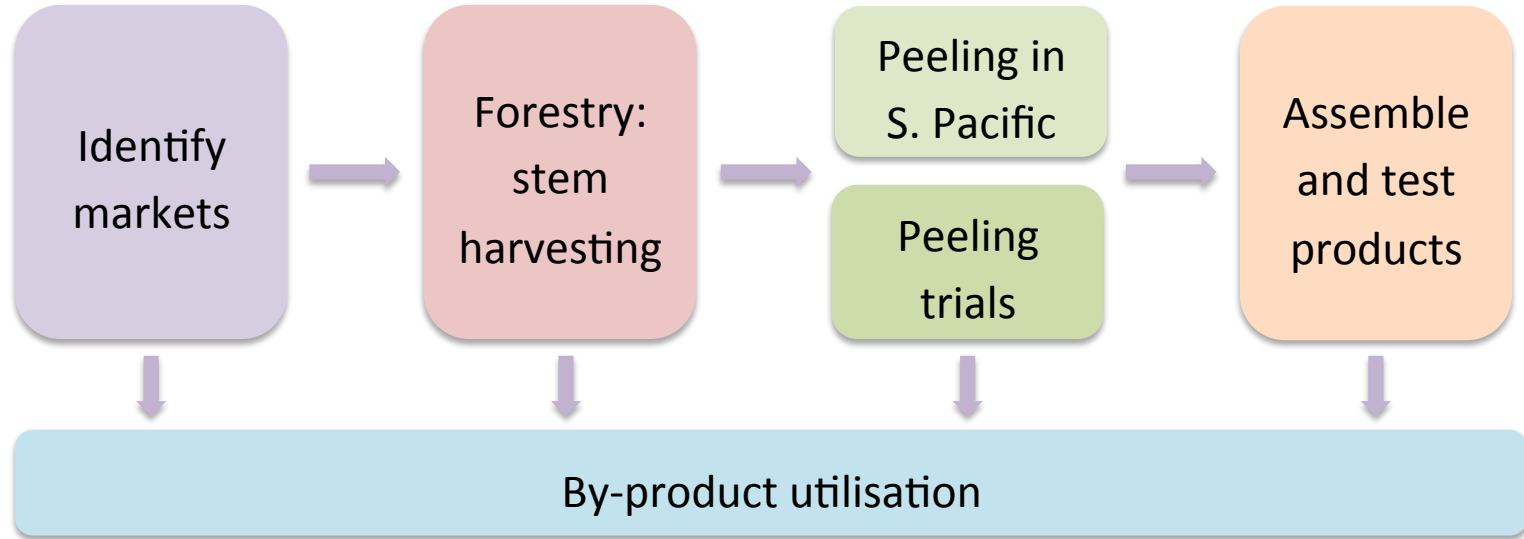
## ***Key completion dates –***

- Initial markets and products defined – Jan 2013
- Interim value chain analysis – January 2014
- Final value chain analysis – October 2015
- Cocowood website updated – October 2012
- Stakeholder meetings –
  - July 2013
  - May 2014
  - May 2012





# Objective 2 – Forestry



# 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

2.1 - Local resource assessment and harvesting

2.2 - Development and training in harvesting and handling protocols

# Objective 2 – Forestry

Forestry:  
stem  
harvesting

## 2.1 - Local resource assessment and harvesting

- Representative resources identified in each partner country
- Stems harvested and transported for use in peeling trials
- Sustainable harvesting practices

# Objective 2 – Forestry

Forestry:  
stem  
harvesting

## 2.2 - Development and training in harvesting and handling protocols

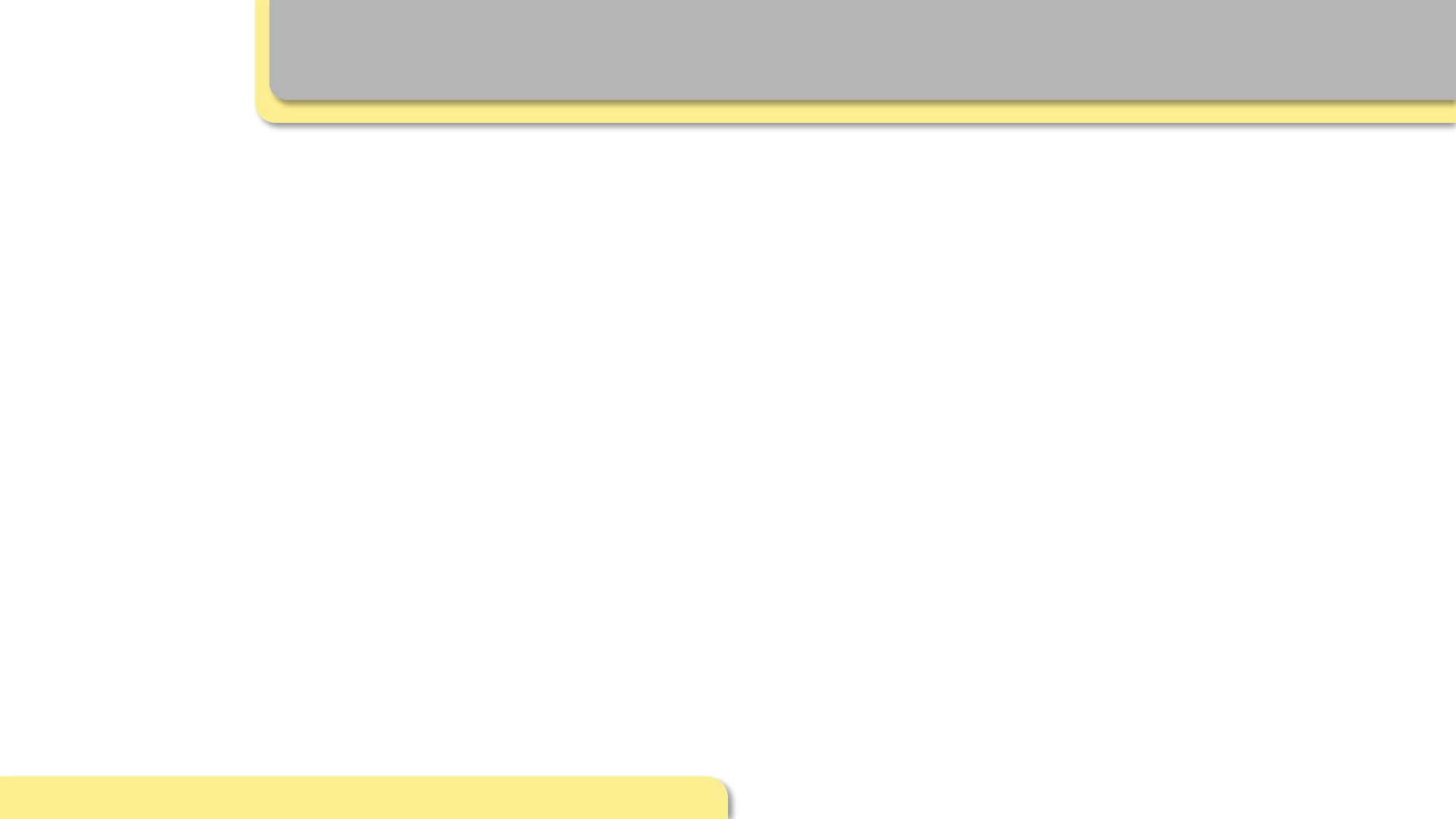
- Protocols developed for low impact harvesting and transportation practices
- Training provided to ensure best practice is followed

# Objective 2 – Forestry

Forestry:  
Stem  
harvesting

## ***Key completion dates –***

- Local resources assessed and obtained for peeling trial 1 – Sep 2012
- Local resources assessed and obtained for peeling trial 3 – Nov 2013
- Local resources assessed and obtained for peeling trial 4 & 5 – Nov 2014
- Harvesting and handling protocols developed – May 2015
- Training sessions – November 2015



# Obj. 3 – Veneer peeling in S. Pacific

Peeling in  
S. Pacific

Peeling  
trials

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

3.1 – Commissioning a spindleless lathe equipment

3.2 – Assessing the potential of a regional trial and  
demonstration program



# Obj. 3 – Veneer peeling in S. Pacific

Peeling in  
S. Pacific

Peeling  
trials

## *3.1 – Commissioning a spindleless lathe equipment*

- Lathe equipment suite procured and commissioned at DEEDI
- Lathe modifications carried out at DEEDI
- Peeling facility then established in Fiji

# Obj. 3 – Veneer peeling in S. Pacific

Peeling in  
S. Pacific

Peeling  
trials

## *3.2 – Assessing the potential of a regional trial and demonstration program*

- Feasibility of transporting the lathe suite between regional centres will be assessed
  - Technical
  - Economic
  - Physical

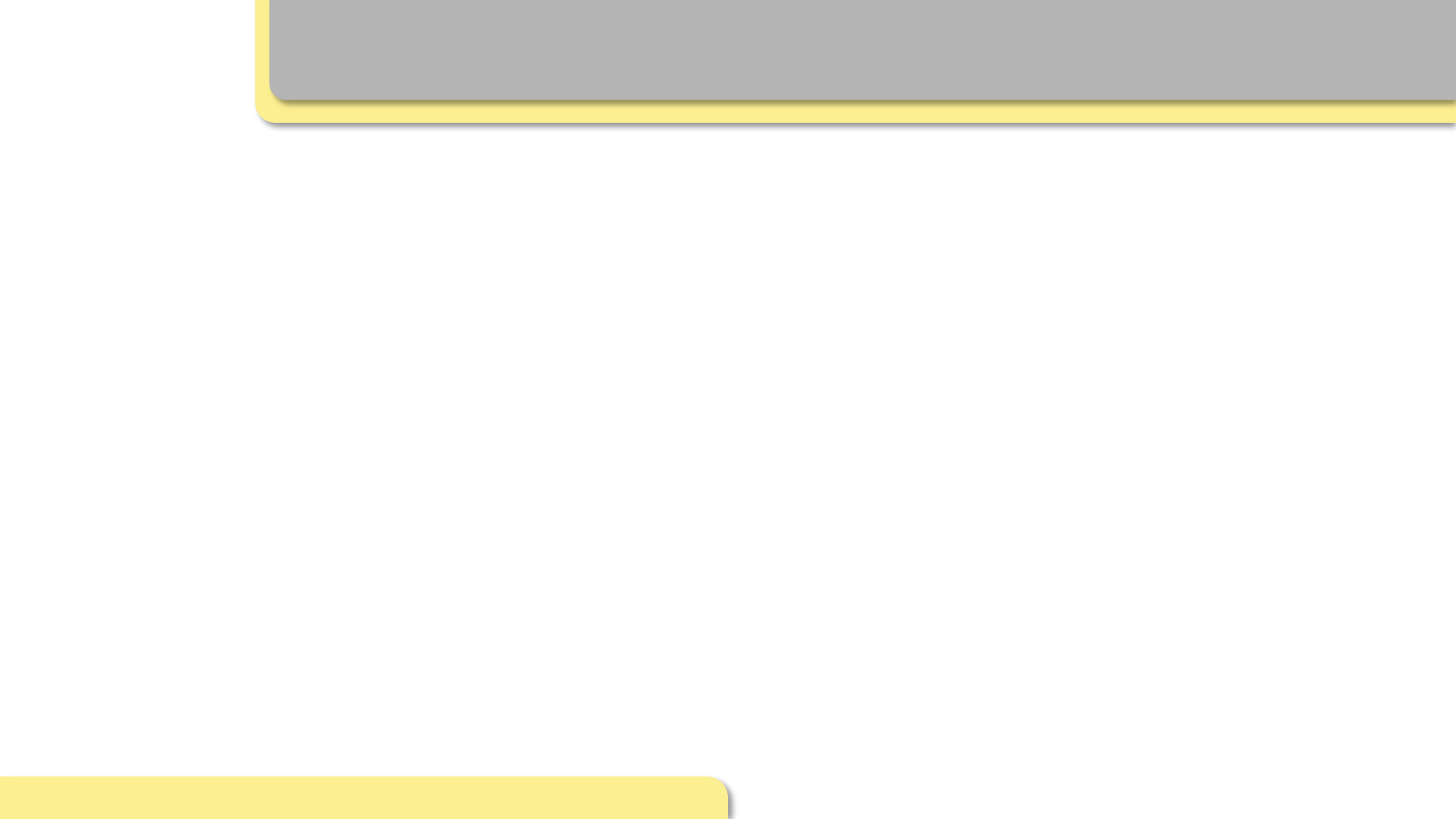
# Obj. 3 – Veneer peeling in S. Pacific

Peeling in  
S. Pacific

Peeling  
trials

## ***Key completion dates –***

- Lathe procured and commissioned at DEEDI – August 2013
- Lathe suite relocated to Fiji – January 2014
- Assessment of potential regional peeling program – July 2014



# 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

4.1 – Assessing veneer processing parameters from cocowood disks

4.2 – Calibrating processing parameters at DEEDI in Queensland

4.3 – Initial compact experimental peeling trial in Fiji

4.4 – Compact commercial peeling trial in Fiji

4.5 – Broad industrial peeling trial in Fiji

4.6 – Properties and recovery assessment

# Objective 4 – Peeling trials

Peeling in  
S. Pacific

Peeling  
trials

## 4.1 – Assessing veneer processing parameters from cocowood disks

- Optimum peeling parameters assessed from disc trials at ENSAM in France
- Micro-lathes used to determine lathe settings and stem pre-conditioning requirements

# Objective 4 – Peeling trials

Peeling in  
S. Pacific

Peeling  
trials

## 4.2 – Calibrating processing parameters at DEEDI in Queensland

- Stem peeling trials in order to calibrate parameters from those established at ENSAM
- Trial includes
  - Pre-conditioning
  - Peeling
  - Grading
  - Drying
  - Handling

# Objective 4 – Peeling trials

Peeling in  
S. Pacific

Peeling  
trials

## 4.3 – Initial compact experimental peeling trial in Fiji

- Stems from two sites in Fiji processed to verify parameters developed
- Recovered material used for production trials
- Stems to be
  - Peeled
  - Dried
  - Graded



# Objective 4 – Peeling trials

Peeling in  
S. Pacific

Peeling  
trials

## 4.4 – Compact commercial peeling trial in Fiji

- Trial to assess viability of commercial production
- Stems from two sites in Fiji processed at VTB mill at Labasa
- Lathe setup verified
- Processing and handling protocols tested and refined
- Recovered material used for product trials

# Objective 4 – Peeling trials

Peeling in  
S. Pacific

Peeling  
trials

## 4.5 – Broad industrial peeling trial in Fiji

- Peeling trial at experimental facility in established in Fiji
- Stems from each resource centre peeled
- Material characteristics determined
- Peeling, handling and grading protocols tested
- Recovered material used for product tests

# Objective 4 – Peeling trials

Peeling in  
S. Pacific

Peeling  
trials

## 4.6 – Properties and recovery assessment

- Recovered veneer quality assessed
- Dried material from each resource centre to be graded
- Strength, dimensional stability, gluing characteristics etc will be determined
- Recovery data collected for economic assessment

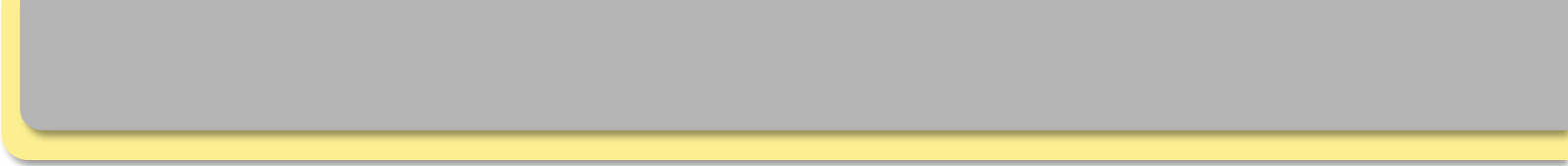
# Objectives 3 & 4 - Peeling

Peeling in  
S. Pacific

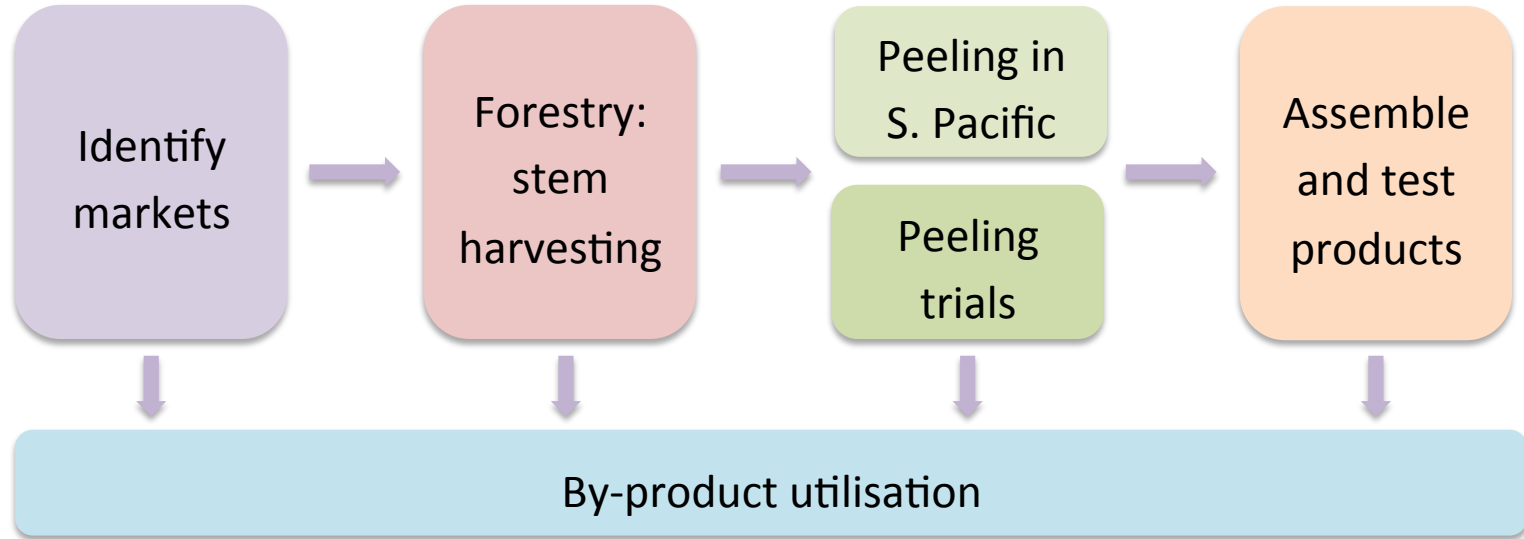
Peeling  
trials

## ***Key completion dates –***

- Disc peeling at ENSAM micro-lathes – Feb 2013
- Calibration peeling trials at DEEDI – Sep 2013
- Peeling trial in Fiji – Sep 2014
- Compact commercial peeling trial in Fiji – Jan 2014
- Commercial peeling trial - August 2015
- Recovered material assessments – after each peeling trial



# Objective 5 - Products



# Objective 5 – Products

Assemble  
and test  
products

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

5.1 – Experimental product assembly

5.2 – Product characterisation and testing

5.3 – Product assessment in-service

# Objective 5 – Products

Assemble  
and test  
products

## 5.1 – Experimental product assembly

- Suitable products assembled from the recovered veneer
- Products developed based on suitable of veneer obtained from different density material
- Products assembled on experimental scale then broadened to commercial



# Objective 5 – Products

Assemble  
and test  
products

## 5.2 – Product characterisation and testing

- Mechanical properties of assembled products determined in accordance with relevant standards
- Properties assessed include
  - Strength, glue-bond, dimensional stability

# Objective 5 – Products

Assemble  
and test  
products

## 5.3 – Product assessment in-service

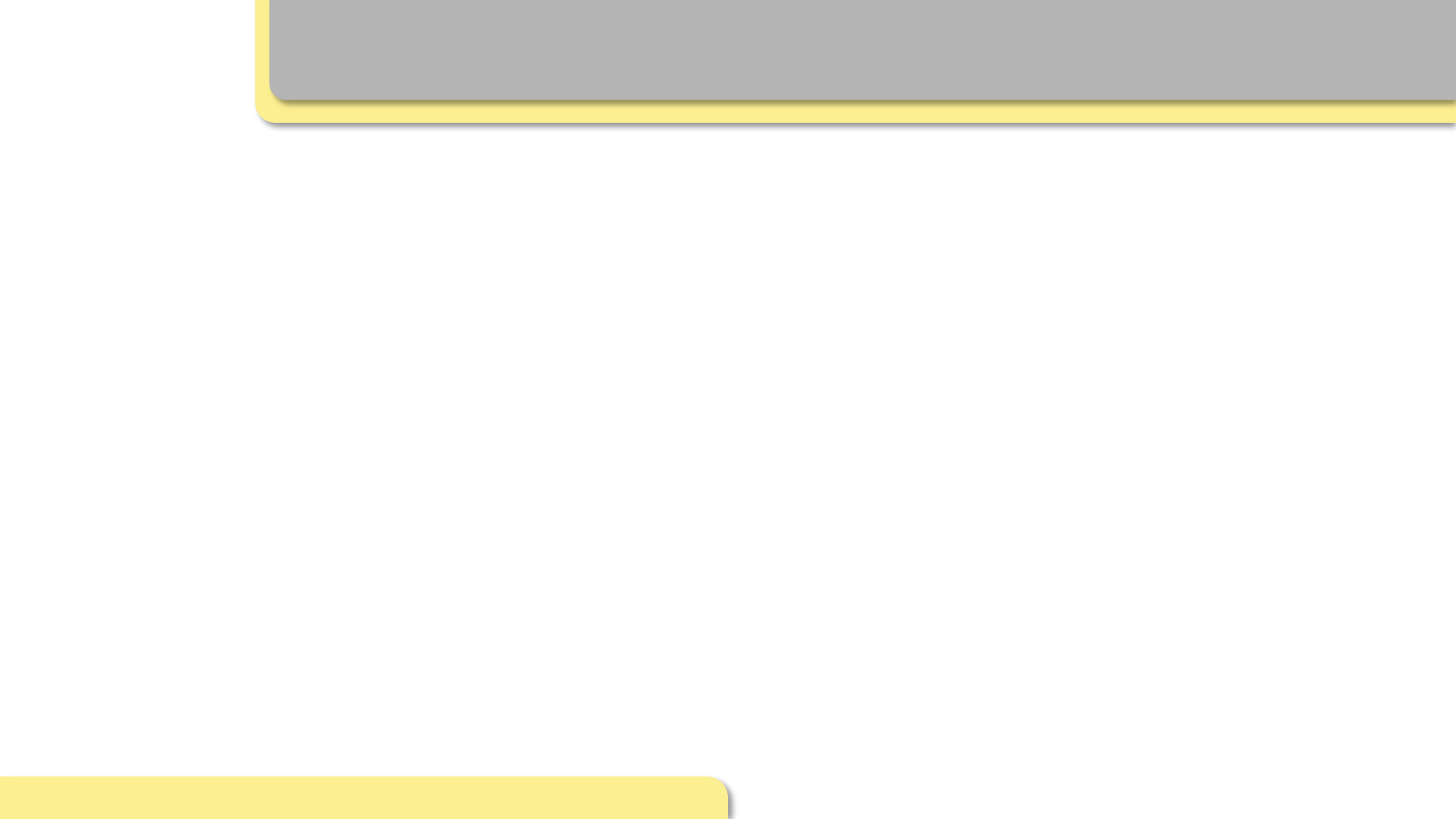
- Demonstration appearance and structural products placed in simulated service conditions
- Products will be benchmarked against existing products
- Work in associated with the Engineered Wood Products Australasia (EWPAA)

# Objective 5 – Products

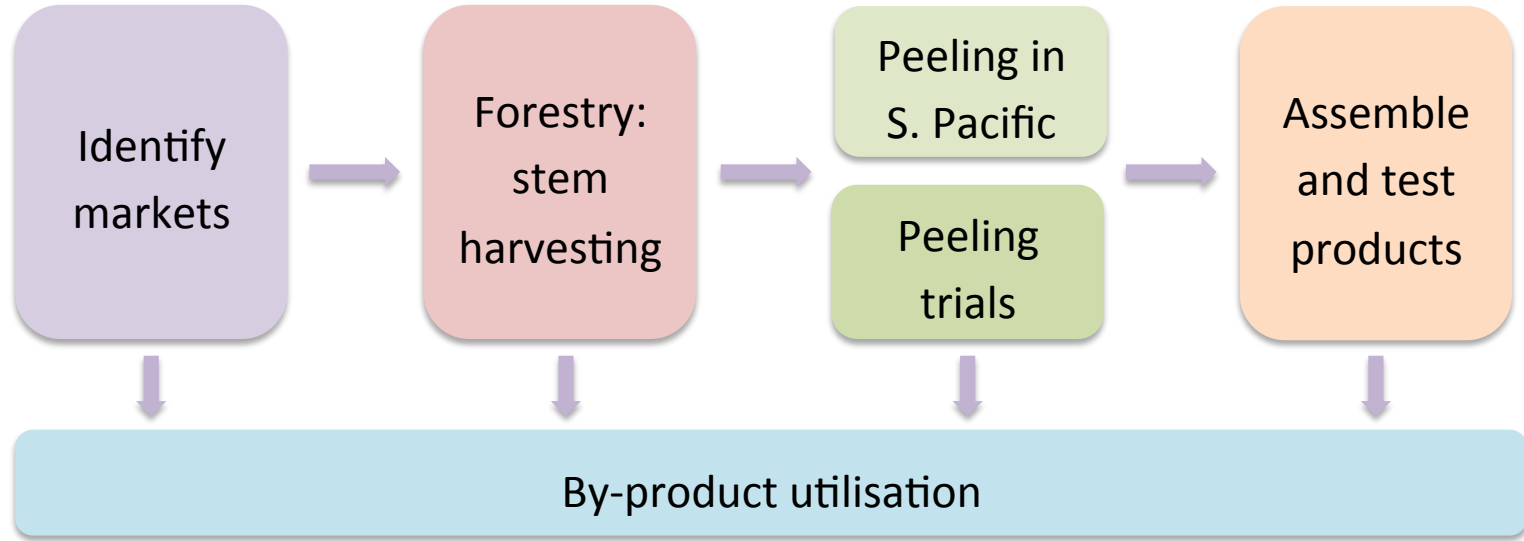
Assemble  
and test  
products

## ***Key completion dates –***

- Experimental product assembly, characterisation and testing –
  - Sep 2013
  - Oct 2014
  - Aug 2015
- Product in-service assessment –
  - Ongoing
  - Report 2015



# Objective 6 – By-product utilisation



# 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

6.1 – Collaboration with agricultural projects

6.2 – Biochar trials

# Objective 6 – By-product utilisation

By-  
product  
utilisation

## 6.1 – Collaboration with agricultural projects

- Residue use could include chip, mulch, bio-char, or growing medium
- The use of forestry residues and peeling residues in agriculture will be coordinated with existing agricultural research projects in the region
- Soft core material supplied for agricultural trials

# Objective 6 – By-product utilisation

By-  
product  
utilisation

## 6.2 – Biochar trials

- Residues obtained will be tested to determine calorific value
- Residues will be tested to assess viability of biochar production

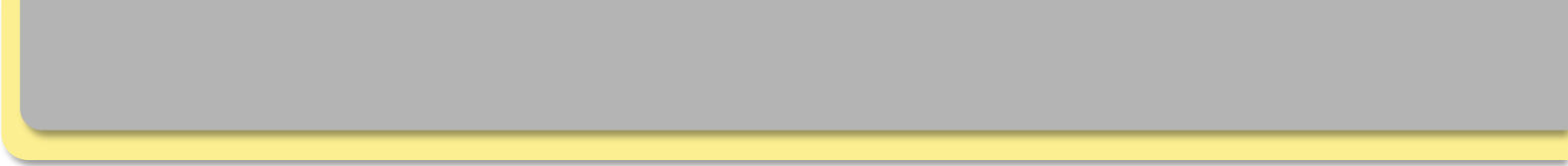


# Objective 6 – By-product utilisation

By-  
product  
utilisation

## ***Key completion dates –***

- Collaboration with agricultural projects – November 2014
- Assessment of cocowood bio-char potential – November 2013
- Biochar produced and trialed – November 2014



# Questions



centre for sustainable  
architecture with wood

