Australian Government
Australian Centre for International Agricultural Research

Forestry

Improvement and management of teak and sandalwood in Papua New Guinea and Australia

Overview

The rich biodiversity of Papua New Guinea's (PNG) natural forests provides many of the products that sustain the livelihoods of the people of PNG. Strong international demand for such products has resulted in the depletion of natural timber sources across the country.

Many parts of lowland PNG with a high rural population have few timber resources remaining, as these were the first areas to be commercially logged. Rising demand for forest products opens up opportunities to establish smallholder-based planted resources to service those markets. As many smallholders in PNG seek alternative cash crops, there is potential to develop appropriate tree growing regimes that complement their existing agricultural activities.

In Australia's Cape York Peninsula, where sandalwood occurs naturally, there are often limited options for commercial development, but initial research under FST/2008/010 showed that forestry provides one of the few promising opportunities. Incorporating sandalwood within existing indigenous land management systems and further extending this into commercial plantings would provide an opportunity to use an endemic tree species for economic development. This project seeks to further develop the high-quality sandalwood identified in Cape York Peninsula and evaluate the potential for commercial partnerships with traditional owners for production of this unique form of sandalwood.

KEY FACTS

ACIAR Project No. FST/2014/069
Duration: August 2015 to July 2019 (4 years)
Target areas: Papua New Guinea (PNG) and Australia
Budget: AU$1,270,775

Project leader
Dr Tony Page, University of the Sunshine Coast

Key partners
- Sylva Systems Pty Ltd
- University of Western Sydney
- PNG Forest Authority
- PNG Forest Research Institute
- Organisation for Industrial, Spiritual and Cultural Advancement (OISCA)
- University of Natural Resources and Environment (UNRE)
- Pacific Island Projects (PIP)

ACIAR Research Program Manager
Dr Nora Devoe

Research/Objective

The project aims to advance the development of germplasm sources and smallholder-friendly silviculture systems for teak (PNG) and sandalwood (PNG and Cape York Peninsula). This will provide new opportunities for enhancing smallholder livelihoods in these regions and achieving PNG's plantation development target.

The project's objectives are to:

- Advance the teak genetic improvement programme in PNG through first generation selection to produce high quality germplasm;
- Ensure maximum realisation of genetic gains made by the project through the development of robust and smallholder appropriate silviculture;
- Develop capacity for an ongoing genetic improvement programme for sandalwood in PNG;
- Advance the sandalwood genetic improvement programme in Cape York Peninsula for use by local landowners; and
- Communicate and disseminate research outputs to improve uptake and impact.

Expected scientific results

- A novel approach to tree selection contributing biological knowledge and tools to aid the selection of germplasm suitable for forestry in PNG, enabling future teak plantings to be established from the best performing and environmentally suited land races.
- A review to determine the factors influencing the onset of reproductive maturity and management interventions to promote early onset and seed set.
- Evaluation of the reproductive biology of sandalwood within existing seed orchards to determine if any biological limiting factors play a role in its low fruit.
- Quantification of genetic variation in PNG sandalwood through assessment of its natural populations, leading to a greater understanding of the overall state of the resource for conservation and domestication purposes.
- Evaluation of the botanical relationship between sandalwood in Cape York Peninsula and PNG, where there is evidence to consider a previously undescribed species that produces a high-quality oil with scientific and potentially commercial impacts.

Expected outcomes

- Enhanced household financial security in terms of cash needs due to the potential liquidity of the trees once they are of a merchantable size; and promotion of intergenerational benefits due to the moderate period of production (20 years).
- Enhanced tree assets underpinning business opportunities (e.g. nurseries, establishment and processing), providing benefits beyond the families developing the trees.
- Increased availability of high-quality germplasm to support new teak and sandalwood plantings.
- Strategically located planted resources from improved germplasm progressively becoming more economically viable to source timber compared with increasingly distant and diminished natural stands.
- Economic advantage of harvesting from planted resources expected to progressively increase through the greater prevalence of supply chain systems to prove legality and sustainability in the marketplace.
- Reinvigoration of the genetically eroded natural sandalwood populations, potentially reducing its current 'threatened' status by village and enrichment plantings with variable seed sources.
- Increased utilisation and/or restoration of marginal or idle agricultural land and logged forest.

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