Australian Government
Australian Centre for International Agricultural Research

Managing risk in South-East Asian forest biosecurity

Key details

Location
Indonesia, Vietnam

Duration

Start Sep 2021 **End** Dec 2025

Budget AUD 1,900,220

Commissioned organisation
University of Tasmania

Partners
Centre for Forestry Instrument Standard Assessment; NSW Department of Primary Industries; University of Tasmania

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Program Forestry

Project code FST/2018/179

Overview

This project aims to provide tools and technologies to underpin good biosecurity practice in SE Asian forestry under current and future climate scenarios, and to transfer and embed this knowledge, in public policy and public and private institutional arrangements and practices, for good plantation biosecurity outcomes.

Research carried out in Indonesia and Vietnam will provide new tools and technologies which can be implemented to better manage biosecurity risks throughout SE Asia. In tropical Southeast (SE) Asia, plantations of acacia and eucalypt species now exceed seven million hectares providing significant potential wood supply and regional development opportunities.

Forestry can provide significant income to both smallholders and industrial growers in SE Asia. In Indonesia, one of the highest priorities remains improving livelihoods for communities from forest products and services (ACIAR Operational Plan 2019-20, p. 87). Similarly, a country priority for Vietnam is increasing value from forests (ACIAR Operational Plan, p. 115).

Project outcomes

- Information will be available, on the current and projected future distribution of selected pest and diseases threats, to guide the deployment of planting material and forest health surveillance.
- Forestry companies, local service providers and research organisations will have recourse to tools and methodology to efficiently detect biotic damage to trees with Unmanned Aerial System (UAS), facilitating an early response to pest and pathogen incursions.
- A suite of management practices for effective biosecurity in SE Asian timber plantations will be well understood and supported by evidence-based participatory research. It will include review of programs distributing germplasm and other technical advances to smallholders and between government and private sector actors.
- Understanding of the potential impact of climate change on the suitability and survival of forest pests and pathogens (PnPs).
- Increasing knowledge and skills for low cost, effective UAS methods for detecting tree damage.
- Including geneticists, plant health experts, climate change scientists, silviculturists and extension officers in forest Research Development and Extension (RDE) work teams, and these teams understanding the need for transdisciplinary approaches to research.
- Women scientists and technical staff in Indonesia and Vietnam are empowered for leadership and delivering excellence in science. Biosecurity risk management becomes an integral part of forest policies, planning, management and any underpinning RDE.
- Tailoring low cost UAS technologies to tropical hardwoods facilitate the efficient detection of pest and pathogen occurrence before damage reaches devastating levels.
- Effective public-private sector collaboration in breeding tolerant germplasm.
- Measuring the success and uptake of new germplasm by smallholders.
- Establishing seed orchards for disease-tolerant germplasm.

Annual progress

2023-24

Datasets have been generated from UAV imagery of five forestry compartments, however analysis is delayed due to a lack of adequate geo-positioning. This will be rectified in a subsequent visit and protocols will be strengthened.

The ability to model the potential distribution of a non-native species has been demonstrated, a new skill for both CC-ROM and the current Climate Futures team. Modelled distribution under the current climate has been verified against a previously published model and the methodology will be applied to projected future climates once the challenge of down-scaling climate predictions for SE Asia's complex geomorphology has been met.

Genotyping of selected Acacia clones has produced a dataset that will facilitate identification of markers for disease tolerance and other desirable characteristics, that will allow preliminary selection of clones for field trials, speeding up the breeding and selection of new germplasm.

An analysis of qualitative data from the Small Research Activity assessing needs and barriers for better biosecurity from practitioners in the region was undertaken to understand how biosecurity is 'problematised' by key experts in the region. The main finding here was that this problematisation was focused on narrow technical and administrative problem solving which can lead to practitioners missing contextual and cross disciplinary opportunities for creative solutions as well as limiting diverse involvement in managing biosecurity.